Tier II Operating Permit Application
Idaho Fresh-Pak Idaho Falls Facility

Idaho Falls, Idaho

Prepared for:

Idaho Fresh Pak, Inc.
6140 West River Road
Idaho Falls, Idaho

June 2007

Project No. 011010

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Prepared for:

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TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

TABLES

FIGURES

APPENDICES

TIER II OPERATING PERMIT APPLICATION

Idaho Fresh Pak, Inc.
Idaho Falls, Idaho

1.0 INTRODUCTION

Idaho Fresh-Pak, Inc. (Fresh-Pak) owns and operates a dehydrated potato production facility near Idaho Falls, Idaho (Idaho Falls facility) (Figure 1-1). Idaho Department of Environmental Quality (DEQ) issued a December 2002 Consent Order directing Fresh-Pak to submit a Tier II air operating permit application addressing a number of emission units that had been constructed without Permits to Construct (PTCs). Fresh-Pak submitted a Tier II operating permit application in June 2003, but DEQ has not acted on that application.

In support of similar permit efforts at its Lewisville facility, Fresh-Pak conducted a number of source tests. Some of these source test results are relevant to emission units at the Idaho Falls facility. In light of those results, Fresh-Pak withdrew the June 2003 Tier II application[1] and is submitting a revised Tier II permit application. As was stated in the request for withdrawal of the application, this revised Tier II application includes proposed emission limits that ensure that facility-wide emissions of any regulated air pollutant will not exceed 100 tons per year. With the proposed limits in place, a Tier I permit will not be required for the Idaho Falls facility.

In this Tier II application, Fresh-Pak proposes to:

- Permit Boiler No. 1 to fire only biofuels, distillate oil, and natural gas
- Limit Boiler No. 1 to 2,640 thousand gallons per year (mgal/yr) of distillate oil. With this limit, facility emissions will be restricted to below Tier I and Title V thresholds
- Incorporate a production cap on the combined "Proctor" belt dryers of 54,000 lb/calendar day with a 59.4 lb/calendar day limit on PM10 emissions
- Incorporate a production cap on the combined flaker lines of 93,600 lb/calendar day with a 141.3 lb/calendar day limit on PM10 emissions

[1] Letter from Brad Bowen, Idaho Fresh-Pak, to Daniel Pitman, Idaho DEQ, dated February 7, 2007.

On behalf of Fresh-Pak, Geomatrix Consultants (Geomatrix) has prepared this revised Tier II Operating Permit application. This application presents the information required by IDAPA 58.01.01.402. Appendix A contains DEQ's PTC/Tier II forms. In accordance with IDAPA 58.01.01.402 and IDAPA 58.01.01.123, a signed compliance statement is included in the permit application transmittal letter and on Form GI.

2.0 PROCESS DESCRIPTION

The Idaho Falls facility is located near Idaho Falls in Bonneville County, Idaho. Bonneville County is attainment or unclassifiable for all criteria pollutants. Figure 1-1 displays the site location while Figure 2-1 provides a site layout depicting buildings, stack locations, and facility property lines.

Fresh-Pak is a potato processing company that dehydrates potatoes to make flakes, slices, and dices. The process includes dryers and dehydration lines, which are sources of particulate matter emissions. Description of the potato process is given below. Figure 2-2 provides a process flow diagram of existing operations.

Trucks deliver potatoes to the plant. The potatoes are unloaded into storage, with much of the rock and silt removed prior to storage. Potatoes are taken from the storage cellars for the process using cold water to transport and wash the potatoes. The potatoes are conveyed to a raw sort table where rot, sticks and other debris are removed. Waste products from the processes described are used for cattle feed.

The potatoes enter a steam peeler, where they are exposed to steam for a brief period of time. This loosens the peeling prior to the brush peeling/washing stage. The steam is exhausted and quenched in a water bath. The peel is fully removed by dry and wet scrubbing using revolving brushes. The potatoes are sorted and transported to the flake lines or the belt dryer lines.

2.1 DRUM DRYERS (FLAKE LINES)

In the flake lines, the potatoes are sent to a pre-cooker, which blanches the material. This operation conditions the starch cells. Potatoes are then cooled and water-transported into cookers where they are exposed to steam to fully cook the potato. The potatoes are riced, forced through slots and broken into smaller pieces like mash, and conveyed to the three steam-heated drum dryers. Each drum dryer has its own exhaust stack.

The mashed/riced potatoes are spread across the face of the drum dryers with applicator rolls. The steam-heated drum dryers rotate and drive the moisture from the potato cells. The removed moisture is exhausted through the drum dryer (a.k.a. flaker) stacks.

The dried potato sheet is cut off the drum and broken into smaller pieces. Good flake goes to mills where it is cut into desired particle size and density (as required by customers) and air-

transported to product separation cyclones (called “vaculifts”). The vaculift units, driven by electrical fans, move dehydrated product and are also used to control product dust during packaging. The flake is then bagged and palletized and sent to either warehousing or distribution.

2.2 BELT DRYERS (PROCTORS)

Correctly sized potatoes may also be pumped to the belt drying operations where they are sliced or diced, and then blanched. After blanching, the potato pieces are distributed across a large belt conveyor and conveyed through the steam-heated ovens (typically referred to by the brand name “Proctor”) for dehydration. The moisture driven from the potato is exhausted to atmosphere.

The slices and dices are sorted into separate packaging lines. The finished potato product is bagged and shipped to either distribution warehousing, customers, or other plants.

3.0 EMISSION SOURCES

All of the emission sources at the Idaho Falls facility are directly associated with dehydrating potato products. As with most facilities of this type, the Idaho Falls facility generates combustion-related emissions associated with the steam-generating and heating units. Additionally, handling, drying, and processing potato products generate particulate emissions.

Table 3-1 lists the Idaho Falls facility's process equipment. Table 3-2 presents calculated criteria pollutant emissions from the entire facility. Further detail regarding the emission calculations can be found in Appendix B. Table 3-3 presents a summary of facility-wide hazardous air pollutant (HAP) and toxic air pollutant (TAP) emissions for regulatory purposes only. The Tier II permit program does not require TAP or HAP ambient air quality compliance demonstrations.

As discussed below, emissions are calculated using a mix of engineering estimates, emission factors from EPA's "AP-42 Compilation of Air Pollution Emission Factors," and source tests on similar units at different facilities. All potential emission sources are addressed in the following sections; those that qualify as insignificant for PTC purposes are as noted.

3.1 BOILERS

Fresh-Pak operates two boilers to provide steam for process units. Boiler No. 1 is rated at 61.6 MMBtu/hr and currently fires only natural gas. Previously, the unit fired residual oil (up to 1.75% sulfur content) in addition to natural gas. Boiler No. 2 is rated at 26.7 MMBtu/hr and fires only natural gas. In this application, Fresh-Pak proposes that Boiler No. 1 be permitted to fire only natural gas, distillate, and biofuels. Boiler No. 2 will still be permitted to fire only natural gas. Neither boiler will be allowed to fire residual oil.

Maximum short-term (lb/hr) boiler emissions are based on the heat input capacity of each boiler. Annual Boiler No. 2 emissions are based on the potential hours of operation (8,760 hours per year) firing natural gas.

Maximum annual emissions for Boiler No. 1 are determined for the boiler potentially burning three fuels. Boiler No. 1 is able to burn natural gas or biofuel or a combination for 8,760 hours per year. However, the boiler could also burn distillate (2,640 mgal/yr) for 5,871 hours per year at the boiler's rated heat input, and fire natural gas and/or biofuels for the rest of the year (i.e., 2,889 hours). Therefore, composite annual emissions are calculated for Boiler No. 1 based on the maximum emission rate on a pollutant-by-pollutant basis between firing natural

gas or biofuels for the entire year or firing distillate for 5,871 hours and firing natural gas or biofuels for the remaining hours.

Emission factors are taken from AP-42 for uncontrolled natural gas boilers (Section 1.2, 7/98), AP-42 for uncontrolled oil-fired boilers (Section 1.3, 9/98), and literature emission factors for biofuel combustion (see Appendix C). "Safety factors" were then applied to the nitrogen oxides (NOx), carbon monoxide (CO), and particulate matter (PM10) emission factors. Table 3-2 identifies maximum potential emissions attributable to firing different fuels in Boiler No. 1 and firing natural gas in Boiler No. 2.

3.2 BELT DRYERS

Fresh-Pak operates three belt dryers (typically referred to by the brand name "Proctor") as part of the Slices and Dices process line. All three Proctors are steam-heated. Fresh-Pak proposes a production limit on the three Proctor belt dryers combined to 54,000 lb/calendar day and a limit on PM_{10} emissions to 59.4 lb/calendar day.

The emission rate is based on the production limit and stack testing from similar units at the Lewisville facility including a "safety factor" to allow operational flexibility. Table 3-2 identifies hourly and annual PM_{10} emissions based on the proposed limits. For modeling purposes in Table 3-2, belt dryer emissions are listed as divided evenly between the three units; please note that this is not to be construed as a separate limit for each individual unit. Combustion emissions associated with the steam heat are addressed under boiler operations.

3.2 BIN DRYERS

Fresh-Pak operates two bin dryers as part of the Slices and Dices process line. Slices and dice piece products are stored in metal bins and are finish-dried by forcing heated air through the bin. The air is heated using gas burners rated at 2.5 and 3.8 MMBtu/hr. As units that fire exclusively natural gas with a heat input of less than 50 MMBtu/hr, the bin dryers qualify under the Category II Exemption for PTCs per IDAPA 58.01.01.222.02.c. For completeness, the bin dryers are included in this application and their emissions quantified.

The only emissions from the bin dryers are those associated with natural gas combustion; negligible process particulate is expected from these bin dryers. Table 3-2 identifies the combustion emissions from these two units. The bin dryers vent inside the main process building; it is assumed that all bin dryer emissions are released to atmosphere through the building vents.

3.3 FLAKE LINES

Fresh-Pak operates three steam-heated flaker drum dryers in the flaker process lines that dry potato product and exhaust the moisture and process particulate through three individual stacks directly to atmosphere without control devices. All three drum dryers utilize steam from the boilers for heat. Fresh-Pak proposes a production limit on the three flaker drum dryers combined to be 93,600 lb/calendar day and a limit on PM_{10} emissions to 141.3 lb/calendar day.

The emission rate is based on the production limit and stack testing from similar units at the Lewisville facility including a "safety factor". Table 3-2 identifies hourly and annual PM_{10} emissions based on the proposed limits. For modeling purposes in Table 3-2, flaker drum dryer emissions are listed as divided evenly between the three units; please note that this is not to be construed as a separate limit for each individual unit. Combustion emissions associated with the steam heat are addressed under boiler operations.

3.5 PNEUMATIC CONVEYING EQUIPMENT

Potato products are pneumatically conveyed through the various processes using Vaculift cyclones. The emission factors for these cyclones are based on stack testing of similar units at Fresh-Pak's Lewisville facility (plus a margin of safety) and the rated air flow of each cyclone. There are four Vaculift cyclones at the Idaho Falls facility:

1. Flaker Lines 1 & 2 Vaculift, used to transport flake from the first two drum dryers to the sizing and inspection process.
2. Flaker Line 3 Vaculift, used to transport flake from the third drum dryer to the sizing and inspection process.
3. Bagroom Dust Vaculift, used to transport flake to the bagging process and also to remove dust associated with bagging flakes.
4. Canline Vaculift, used to transport flake to the packaging process.

3.6 SPACE HEATING/AIR MAKE-UP UNITS

Fresh-Pak uses three natural gas-fired air makeup fan units in the facility: the Fresh Air Make-Up Fan (Waste Plant) rated at 2.5 MMBtu/hr, the Fresh Air Make-Up Fan (Flaker Room) rated at 2.5 MMBtu/hr, and the Fresh Air Make-Up Fan (Bag Room) rated at 5 MMBtu/hr. These units provide heat and prevent condensation during the cold months, and provide fresh air during the warm months. As units that fire exclusively natural gas with a heat input of less than 50 MMBtu/hr, the bin dryers qualify under the Category II Exemption for PTCs per

IDAPA 58.01.01.222.02.c. For completeness, the bin dryers are included in this application and their emissions quantified.

Total emissions from the air makeup fan units are estimated based on the combined rating of the units and AP-42 emission factors for external natural gas combustion including a "safety factor". The air makeup fan units vent inside the buildings; it is conservatively assumed that all exhaust emissions are released to atmosphere through the building vents.

3.7 FUGITIVE EMISSIONS

The only sources of process dust at the facility are the flaker lines, and conveyance of flakes is enclosed and takes place within buildings. The only other possible source of dust is vehicle travel on paved roads. Fresh-Pak believes fugitive dust generated by vehicles to be negligible.

3.8 STORAGE TANKS

Fresh-Pak maintains two fuel storage tanks on-site: the large storage tank with a capacity of 200,000 gallons and the small storage tank with a capacity of 14,400 gallons. To allow facility operational flexibility, emissions are calculated assuming that the entire potential distillate throughput (i.e., 2,640,000 gallons per year) is routed through each individual tank. Emissions are calculated using the TANKS software Version 4.0 based on the AP-42 emission calculation methodology.

4.0 POTENTIALLY APPLICABLE REGULATIONS

The Idaho Falls facility is subject to federal and state air pollution control regulations. This section discusses each applicable regulation and details why other federal and state regulations are not applicable.

4.1 FEDERAL REQUIREMENTS

4.1.1 National Emission Standards for Hazardous Air Pollutants

EPA has established National Emission Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR 63 to regulate HAP emissions from "major sources" of HAP. This regulatory program defines a "major source" as any facility that has the potential to emit more than 10 tons of a single HAP or more than 25 tons of all HAP combined.

Dried potato production does not generate HAPs, so combustion of fossil fuels is the only source of HAPs at the Idaho Falls facility. As detailed in Table 3-3, total HAP emissions from combustion in the bin dryers, the air makeup fan units, and the boilers are 0.93 tpy, which is well below the major source thresholds.

4.1.2 New Source Performance Standards

EPA has established New Source Performance Standards (NSPS) for new, modified, or reconstructed facilities and source categories. Only the facility boilers and storage tanks have potentially applicable NSPS subparts; no other NSPS subparts potentially apply to any other facility equipment.

Boiler No. 1, rated at 61.6 MMBtu/hr, was installed in 1974 and was modified in 1981. Boiler No. 2, rated at 26.7 MMBtu/hr, was installed in 1968 and has not been modified since then. Due to the sizes of the boilers and the dates of construction or modification, the boilers are not subject to NSPS requirements.

NSPS Subpart K applies to petroleum liquid storage tanks that have a capacity greater than 65,000 gallons and were built, modified (as defined by NSPS rules), or reconstructed after June 11, 1973 and prior to May 19, 1978, the subpart's applicability date range. The large storage tank with a capacity of 200,000 gallons was constructed in 1974 and has not been modified since then. Therefore, the large tank is subject to NSPS Subpart K. However, because the large storage tank stores distillate, with both a Reid vapor pressure and a maximum true vapor

pressure of less than 1.0 psia, the large tank has no control requirements and is exempt from any monitoring requirements.

NSPS Subpart Ka applies to storage tanks that have a capacity greater than 40,000 gallons that is used to store petroleum liquids for which construction is commenced after May 18, 1978. NSPS Subpart Kb applies to storage tanks that have a capacity greater than or equal to 19,813 gallons and were built, modified, or reconstructed after July 23, 1984. The small tank was installed in 1981 and has a capacity of 14,400 gallons. As such, the small tank is not subject to any NSPS requirements.

4.1.3 Prevention of Significant Deterioration

Potato processing plants are not designated facilities under 40 CFR 52.21(b); as such, these types of facilities are deemed minor sources for the purposes of the Prevention of Significant Deterioration (PSD) program unless emissions of a regulated pollutant exceeds 250 tons per year. As indicated in Table 3-2, the facility's PTE of regulated pollutants is less than the 250-ton major source threshold. Accordingly, the Idaho Falls facility is not subject to the PSD program.

4.1.4 Title IV Acid Rain Provisions

Title IV of the federal Clean Air Act regulates sulfur dioxide (SO2) and NOx emissions from fossil fuel-fired electrical generation facilities. The Idaho Falls facility's boilers are not used to generate electricity. Accordingly, the Idaho Falls facility is not subject to the Title IV Acid Rain Provisions in the Clean Air Act.

4.1.5 Title V Operating Permit

Title V of the federal Clean Air Act requires facilities with the potential to emit more than 100 tons of a regulated criteria pollutant, 10 tons of a single HAP, or 25 tons of all HAP combined on an annual basis to obtain a Title V Operating Permit. EPA delegated this regulatory program to DEQ. With the emission limits proposed in this application established in a Tier II operating permit, Fresh-Pak's Idaho Falls facility will not be subject to Title V because its annual PTE will not exceed the applicability thresholds.

4.1.6 Compliance Assurance Monitoring

EPA established the Compliance Assurance Monitoring (CAM) program to regulate major facilities with emission sources that employ a control device to maintain compliance with an

enforceable emission limit. As shown in Table 3-2, the Idaho Falls facility is committed to a minor source status. Therefore, this regulatory program does not apply to this facility.

4.2 STATE REQUIREMENTS

4.2.1 Permit to Construct Program

DEQ's PTC regulations require all facilities to obtain a PTC or a documented exemption determination before beginning construction of a new source of air pollution or modifying an existing source in a manner that would cause its emissions to increase. This Tier II permit application is intended, in part, to resolve any potential legacy PTC issues at the Idaho Falls facility. Fresh-Pak will submit PTC applications before constructing any new sources or modifying any existing sources such that a PTC is required.

4.2.2 Tier II Operating Permit / Consent Order

DEQ issued a Consent Order in December 2002 to Fresh-Pak's Idaho Falls facility. This Consent Order directed Fresh-Pak to pay a fine and submit a Tier II air operating permit to address emission units that had been constructed or modified without PTCs. Fresh-Pak submitted a Tier II permit application in June 2003 as required by the Consent Order.

In support of similar permit efforts at the Lewisville facility, Fresh-Pak conducted a number of source tests. Some of these source test results are relevant to emission units at the Idaho Falls facility. In light of those results, Fresh-Pak withdrew the June 2003 Tier II application[2] and is submitting a revised Tier II permit application. As was stated in the request for withdrawal of the application, this revised Tier II application includes proposed emission limits that ensure that facility-wide emissions of any regulated air pollutant will not exceed 100 tons per year. As such, a Tier I permit will not be required for the Idaho Falls facility.

4.2.3 General Requirements

Several general provisions apply to potato processing operations and the boilers. A more detailed listing of the applicable and inapplicable federal and state air quality regulations, as well as additional information regarding the applicability determinations, is included as Appendix D. The rules with explicit emission limitations are summarized below.

IDAPA 58.01.01.625 limits visible emissions from any source for a period or periods aggregating more than 3 minutes in any 60-minute period to 20% opacity.

[2] Letter from Brad Bowen, Idaho Fresh-Pak, to Daniel Pitman, Idaho DEQ, dated February 7, 2007.

IDAPA 58.01.01.677 limits particulate matter emissions from the boilers to 0.05 gr/dscf when firing liquid fuels and 0.015 gr/dscf when burning natural gas (both corrected to 3% O_2).

IDAPA 58.01.01.700 limits particulate matter emissions from process equipment based on the date of installation and the throughput of the unit (in pounds per hour). The three proctors and the Flaker Drum Dryers 1 and 2 are all considered existing units under this rule because they were operational before October 1, 1979; the four vaculifts and Flaker Drum Dryer 3 are considered new units because they were installed after that date. However, the same equation for calculating the process weight limit applies to all of the units because the average hourly throughput per unit is less than 9,250 lb/hr for new units and 17,000 lb/hr for existing units. The process weight limit equations are (PW = Process Weight):

Operation after October 1, 1979

- PW< 9,250 lb/hr, $E = 0.045(PW)^{0.60}$, IDAPA 58.01.01.701(a)
- PW> 9,250 lb/hr, $E = 1.10(PW)^{0.25}$, IDAPA 58.01.01.701(b)

Operation before October 1, 1979

- PW< 17,000 lb/hr, $E = 0.045(PW)^{0.60}$, IDAPA 58.01.01.702(a)

Table 4-1 confirms that all PM_{10} emission rates at Fresh Pak are lower than the process weight PM limit.

IDAPA 58.01.01.728.02 limits the sulfur content of ASTM Grade 2 fuel oil to 0.5 percent by weight.

5.0 DISPERSION MODELING ANALYSIS

Geomatrix applied computer-based dispersion modeling techniques to simulate local dispersion of criteria pollutant emissions from the Idaho Falls facility. Modeling results are used to show the facility does not cause or significantly contribute to a violation of any ambient air quality standard as required in IDAPA 58.01.01.403.02. Geomatrix submitted a dispersion modeling protocol to DEQ on June 20, 2007 prior to conducting the modeling analysis; the protocol is provided as Appendix E. A compact disk containing the air quality modeling input files is included in Appendix F.

The modeling analysis was performed according to the modeling protocol. Any variations from the modeling protocol are discussed below.

5.1 DISPERSION MODEL SELECTION

As of November 9, 2005, AERMOD replaced ISCST3 as the model recommended by the EPA's *Guideline on Air Quality Models* (codified as Appendix W to 40 CFR Part 51) as the preferred dispersion model for complex source configurations and for sources subject to building downwash. As was stated in the protocol, the latest version of the EPA regulatory model AERMOD (version 07026) was used for the dispersion modeling analysis.

5.2 DISPERSION MODEL INPUTS

5.2.1 Emission Rates

A total of fifteen point sources were used to represent the Idaho Falls facility's emission sources. The facility's two bin dryers and three air makeup units (AMUs) are all located in building #3 and vent directly into the building rather than to atmosphere through individual exhaust vents. During the submission of the modeling protocol to DEQ, Geomatrix believed the emissions from the bin dryers and AMUs would be released to atmosphere through the various windows and doors and building #3. However, there are actually three plant fans that pull air from inside the facility and vent the air to atmosphere. For modeling purposes, Geomatrix split the combined bin dryers and AMUs emissions equally between the three plant vent stacks.

Geomatrix completed AERMOD simulations using the maximum potential facility criteria pollutant emission rates for all of the sources at the Idaho Falls facility, as shown in Table 3-2.

5.2.2 Stack Parameters and Building Configuration

Figure 2-1 shows the updated site plan of the Idaho Falls facility with the locations of the fifteen emission point stacks as well as significant structures that could potentially influence downwash from the stacks. Table 5-1 summarizes the release parameters that were used to represent the facility stacks in the modeling analysis, including typical exhaust temperatures and exhaust flowrates provided by Fresh-Pak. Horizontal stack releases are given an exit velocity of 0.001 m/s to represent no plume rise due to momentum and an exit diameter of 0.001 m to prevent the effects of stack-tip downwash on a horizontal stack.

As was stated in the modeling protocol, in addition to the stack locations, the existing building locations and dimensions were provided to AERMOD to assess potential downwash effects. Wind direction-specific building profiles were prepared for modeling by using the EPA's Prime version of the Building Profile Input Program (BPIP PRIME). The facility layout and building elevations, provided by Fresh-Pak, were used to prepare the data input file for BPIP PRIME, which then provides AERMOD with necessary building downwash parameters. Table 5-2 presents the heights of all buildings included in the dispersion modeling analysis.

5.2.3 Elevation Data and Receptor Network

As was stated in the protocol, terrain elevations for receptors and emission sources were prepared using digital elevation models (DEMs) developed by the United States Geological Survey of nine 7.5-minute quadrangles obtained from the internet (http://www.mapmart.com): Ammon, Idaho Falls North, Idaho Falls South, Lewisville, Rigby, Roberts, Shattuck Butte, Ucon, and Woodville. These data have a horizontal spatial resolution of 10 meters (m). The 10-kilometer (km) square simulation domain that was used to assess the Idaho Fall facility potential emission impacts is shown in Figure 1-1.

For the dispersion modeling analysis, three nested receptor grids, each centered on the facility, were developed: an outer grid to the maximum extent of the domain with 250-meter spacing, a 5-km by 5-km nested grid with 100-meter spacing, and a 1-km by 1-km receptor grid with 25-m spacing. Receptors were also located at 10-m intervals along the facility fenceline. The base elevation and hill height scale for each receptor were determined using the EPA's terrain processor, AERMAP (Version 06341). AERMAP generates a receptor output file formatted for use by AERMOD. The modeling receptor grids are shown in Figure 5-1.

5.2.4 Meteorological Data

As was stated in the protocol, Geomatrix used a five-year meteorological database that was constructed using available surface and upper air data for the dispersion modeling analysis. A representative five-year meteorological data set was prepared using available surface and upper air meteorological data. Surface meteorology from the Idaho National Laboratory (INEEL) station in Idaho Falls, Idaho with missing data supplemented by surface observations from the INEEL station in Roberts, Idaho and National Weather Service (NWS) surface observations from Idaho Falls Fanning Field was combined with NWS upper air data from the Boise Airport. A wind rose presenting five years of surface wind speed and wind direction from the Idaho Falls station is shown in Figure 5-2. The wind rose shows predominantly high winds from the southwest and south directions following the Snake River valley and slower winds from the north direction. The average wind speed is 3.24 meters per second (m/s); and calm conditions occur less than 0.07 percent of the time.

Additional meteorological variables and geophysical parameters are required for use in the AERMOD dispersion modeling analysis to estimate the surface energy fluxes and construct boundary layer profiles. Surface characteristics including the surface roughness length, the albedo, and the Bowen ratio will be assigned on a sector-by-sector basis using land-use data within three kilometers of the Idaho Falls meteorological site. The USGS 1992 National Land Cover land-use data set (NLCD92) to be used in the analysis has a 30-meter mesh size and over 30 land-use categories.[3] The NLCD92 land-use designations were compared to a current aerial photograph of the three kilometer area surrounding the Idaho Falls meteorological site and the NLCD92 data are appropriate for land-use determinations.

The NLCD92 data were processed using the utilities that accompany the CALPUFF modeling system. Land-use will be characterized using 12 sectors surrounding the facility. Within each sector, a weighted average surface roughness length, albedo, and Bowen ratio are calculated from the characteristics recommended for each land use by the CALPUFF utility program MAKEGEO. Similar to calculations made by the MAKEGEO preprocessor, the arithmetic averages were calculated for the albedo and Bowen ratio, while the geometric average was calculated for the surface roughness of each upwind sector. This land-use analysis and corresponding surface roughness lengths, albedo, and Bowen ratios are shown in Figure 5-3.

[3] The USGS NLCD92 data set is described and can be accessed at http://landcover.usgs.gov/natllandcover.php

The EPA meteorological program AERMET (Version 06341) was used to combine the hourly surface meteorological observations with twice daily upper air soundings from the Boise airport and derive the necessary meteorological variables for AERMOD. The upper air data were used to estimate the temperature lapse rate aloft and subsequently be used by AERMET to predict the development of the mixed layer height. The Bulk-Richardson option was used to estimate dispersion variables and surface energy fluxes during nocturnal periods, while solar radiation and wind speed are used by AERMET to estimate these same variables during the day.

5.3 DISPERSION MODEL RESULTS

Geomatrix conducted a dispersion modeling analysis to support a Tier II permit application for the Fresh-Pak Idaho Falls facility in Idaho Falls, Idaho. Results from the AERMOD simulations, representative background concentrations, and the applicable National Ambient Air Quality Standards (NAAQS) are shown in Table 5-3. Our analysis indicates that the criteria pollutant concentrations attributable to the Idaho Falls facility, when combined with the representative background concentrations, are in compliance with the applicable NAAQS.

TABLES

TABLE 3-1

FACILITY AIR EMISSION SOURCES

Fresh-Pak
Idaho Falls, Idaho

Source	Date Install / Modified	Manufacturer	Rating	Capacity	Fuel
Boiler No.1	1974 / 1981	Cleaver Brooks	61.6 MMBtu		Nat. Gas, Distillate, Biofuel
Boiler No.2	1968	Cleaver Brooks	26.7 MMBtu		Nat. Gas
Bin Dryer 1	1971	King	2.5 MMBtu		Nat. Gas
Bin Dryer 2	1971		3.8 MMBtu		Nat. Gas
Fresh Air Makeup Fan Unit (Waste Plant)	1971		2.5 MMBtu		Nat. Gas
Fresh Air Makeup Fan Unit (Flaker Room)	1971		2.5 MMBtu		Nat. Gas
Fresh Air Makeup Fan Unit (Bag Room)	1971		5 MMBtu		Nat. Gas
Flaker Drum Dryer 1	1974	Blawknox		54,000 lb per calendar day	Steam
Flaker Drum Dryer 2	1974	Blawknox			Steam
Flaker Drum Dryer 3	2001	Idaho Steel			Steam
Proctor 1	1965	Proctor & Schwartz		93,600 lb per calendar day	Steam
Proctor 2	1965	Proctor & Schwartz			Steam
Proctor 3	1965	Proctor & Schwartz			Steam
Flaker Lines 1 & 2 Vaculift	1981				
Flaker Lines 3 Vaculift	1995				
Bagroom Vaculift	1995				
Canline Vaculift	2002				
Large Tank	1974			200,000 gal	
Small Tank	1981			14,400 gal	

TABLE 3-2.

FACILITY-WIDE POTENTIAL CRITERIA POLLUTANT EMISSIONS

Tier II Operating Permit Application
Idaho Falls, Idaho

Source	NOx		CO		SO2		PM10		VOC	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Boiler 1	13.5	52.9	10.3	45.3	31.9	93.9	5.1	22.3	0.3	1.5
Boiler 2	4.0	17.5	4.5	19.6	0.02	0.1	0.4	1.8	0.15	0.6
Belt dryer 1 (Proctor 1)	--	--	--	--	--	--	0.8	3.6	--	--
Belt dryer 2 (Proctor 2)	--	--	--	--	--	--	0.8	3.6	--	--
Belt dryer 3 (Proctor 3)	--	--	--	--	--	--	0.8	3.6	--	--
Flaker line 1	--	--	--	--	--	--	2.0	8.6	--	--
Flaker line 2	--	--	--	--	--	--	2.0	8.6	--	--
Flaker line 3	--	--	--	--	--	--	2.0	8.6	--	--
Flaker lines 1& 2 vaculift	--	--	--	--	--	--	0.2	0.7	--	--
Flaker line 3 vaculift	--	--	--	--	--	--	0.1	0.6	--	--
Bin Dryer 1	0.4	1.6	0.4	1.8	0.002	0.007	0.04	0.2	0.01	0.06
Bin Dryer 2	0.6	2.5	0.6	2.8	0.002	0.01	0.06	0.3	0.02	0.09
Bagroom dust vaculift	--	--	--	--	--	--	0.08	0.4	--	--
Canline vaculift	--	--	--	--	--	--	0.07	0.3	--	--
Fresh Air Make-Up Fan (Waste Plant)	0.4	1.6	0.4	1.8	0.002	0.007	0.04	0.2	0.01	0.06
Fresh Air Make-Up Fan (Flaker Room)	0.4	1.6	0.4	1.8	0.002	0.007	0.04	0.2	0.01	0.06
Fresh Air Make-Up Fan (Bag Room)	0.8	3.3	0.8	3.7	0.003	0.01	0.08	0.3	0.03	0.1
Large Tank (200,000 gallons)	--	--	--	--	--	--	--	--	0.007	0.03
Small Tank (14,400 gallons)	--	--	--	--	--	--	--	--	0.002	0.007
Total =	**19.9**	**81.2**	**17.6**	**77.0**	**31.9**	**94.0**	**14.6**	**63.8**	**0.6**	**2.6**

TABLE 3-3.

FACILITY-WIDE POTENTIAL TAP AND HAP EMISSIONS[(A)]

Tier II Operating Permit Application
Idaho Falls, Idaho

Pollutant	Distillate Oil Emission Factor [b] ($lb/10^3$ gal)	Natural Gas Emission Factor [c] (lb/MMscf)	Boiler No. 1 Emissions (lb/yr)	Boiler No. 2 Emissions (lb/yr)	Bin Dryer Emissions (lb/yr)	Air Makeup Units Emissions (lb/yr)	Total Emissions (tpy)	HAP?	TAP?
2-Methylnaphthalene	--	2.4E-05	1.30E-02	5.61E-03	1.32E-03	2.10E-03	1.10E-05	No	No
3-Methylchloranthrene	--	1.8E-06	9.71E-04	4.21E-04	9.93E-05	1.58E-04	8.25E-07	No	Yes
7,12-Dimethylbenz(a)anthracene	--	1.6E-05	8.63E-03	3.74E-03	8.83E-04	1.40E-03	7.33E-06	No	No
Acenaphthene	--	1.8E-06	9.71E-04	4.21E-04	9.93E-05	1.58E-04	8.25E-07	No	No
Acenaphthylene	--	1.8E-06	9.71E-04	4.21E-04	9.93E-05	1.58E-04	8.25E-07	No	No
Anthracene	--	2.4E-06	1.30E-03	5.61E-04	1.32E-04	2.10E-04	1.10E-06	No	No
Arsenic	5.5E-07	2.0E-04	1.08E-01	4.68E-02	1.10E-02	1.75E-02	9.16E-05	Yes	Yes
Barium	--	4.4E-03	2.37E+00	1.03E+00	2.43E-01	3.85E-01	2.02E-03	No	Yes
Benz(a)anthracene	--	1.8E-06	9.71E-04	4.21E-04	9.93E-05	1.58E-04	8.25E-07	No	No
Benzene	--	2.1E-03	1.13E+00	4.91E-01	1.16E-01	1.84E-01	9.62E-04	Yes	Yes
Benzo(a)pyrene	--	1.2E-06	6.48E-04	2.81E-04	6.62E-05	1.05E-04	5.50E-07	No	Yes
Benzo(b)fluoranthene	--	1.8E-06	9.71E-04	4.21E-04	9.93E-05	1.58E-04	8.25E-07	No	No
Benzo(g,h,i)perylene	--	1.2E-06	6.48E-04	2.81E-04	6.62E-05	1.05E-04	5.50E-07	No	No
Benzo(k)fluoranthene	--	1.8E-06	9.71E-04	4.21E-04	9.93E-05	1.58E-04	8.25E-07	No	No
Beryllium	4.1E-07	1.2E-05	6.48E-03	2.81E-03	6.62E-04	1.05E-03	5.50E-06	Yes	Yes
Butane	--	2.1E+00	1.13E+03	4.91E+02	1.16E+02	1.84E+02	9.62E-01	No	No
Cadmium	4.1E-07	1.1E-03	5.94E-01	2.57E-01	6.07E-02	9.64E-02	5.04E-04	Yes	Yes
Chromium III [e]	2.1E-07	7.0E-04	3.78E-01	1.64E-01	3.86E-02	6.13E-02	3.21E-04	Yes	Yes
Chromium VI [e]	2.1E-07	7.0E-04	3.78E-01	1.64E-01	3.86E-02	6.13E-02	3.21E-04	Yes	Yes
Chrysene	--	1.8E-06	9.71E-04	4.21E-04	9.93E-05	1.58E-04	8.25E-07	No	No
Cobalt	--	8.4E-05	4.53E-02	1.96E-02	4.64E-03	7.36E-03	3.85E-05	Yes	Yes
Copper	8.2E-07	8.5E-04	4.59E-01	1.99E-01	4.69E-02	7.45E-02	3.89E-04	No	Yes
Dibenzo(a,h)anthracene	--	1.2E-06	6.48E-04	2.81E-04	6.62E-05	1.05E-04	5.50E-07	No	No
Dichlorobenzene	--	1.2E-03	6.48E-01	2.81E-01	6.62E-02	1.05E-01	5.50E-04	No	No
Ethane	--	3.1E+00	1.67E+03	7.25E+02	1.71E+02	2.72E+02	1.42E+00	No	No
Fluoranthene	--	3.0E-06	1.62E-03	7.02E-04	1.66E-04	2.63E-04	1.37E-06	No	No
Fluorene	--	2.8E-06	1.51E-03	6.55E-04	1.55E-04	2.45E-04	1.28E-06	No	No

Pollutant	Distillate Oil Emission Factor [b] ($lb/10^3$ gal)	Natural Gas Emission Factor [c] (lb/MMscf)	Boiler No. 1 Emissions (lb/yr)	Boiler No. 2 Emissions (lb/yr)	Bin Dryer Emissions (lb/yr)	Air Makeup Units Emissions (lb/yr)	Total Emissions (tpy)	HAP?	TAP?
Formaldehyde	6.1E-02	7.5E-02	1.74E+02	1.75E+01	4.14E+00	6.57E+00	1.01E-01	Yes	Yes
Hexane	--	1.8E+00	9.71E+02	4.21E+02	9.93E+01	1.58E+02	8.25E-01	Yes	Yes
Indeno(1,2,3-cd)pyrene	--	1.8E-06	9.71E-04	4.21E-04	9.93E-05	1.58E-04	8.25E-07	No	No
Lead	1.2E-06		3.26E-03	0.00E+00	0.00E+00	0.00E+00	1.63E-06	Yes	No
Manganese	8.2E-07	3.8E-04	2.05E-01	8.89E-02	2.10E-02	3.33E-02	1.74E-04	Yes	Yes
Mercury	4.1E-07	2.6E-04	1.40E-01	6.08E-02	1.43E-02	2.28E-02	1.19E-04	Yes	Yes
Molybdenum	--	1.1E-03	5.94E-01	2.57E-01	6.07E-02	9.64E-02	5.04E-04	No	Yes
Naphthalene	--	6.1E-04	3.29E-01	1.43E-01	3.37E-02	5.34E-02	2.79E-04	Yes	Yes
Nickel	4.1E-07	2.1E-03	1.13E+00	4.91E-01	1.16E-01	1.84E-01	9.62E-04	Yes	Yes
Pentane	--	2.6E+00	1.40E+03	6.08E+02	1.43E+02	2.28E+02	1.19E+00	No	Yes
Phenanathrene	--	1.7E-05	9.17E-03	3.98E-03	9.38E-04	1.49E-03	7.79E-06	No	No
Polyaromatic Hydrocarbons [f]	--	1.1E-05	6.15E-03	2.67E-03	6.29E-04	9.99E-04	5.22E-06	No	Yes
Propane	--	1.6E+00	8.63E+02	3.74E+02	8.83E+01	1.40E+02	7.33E-01	No	No
Pyrene	--	5.0E-06	2.70E-03	1.17E-03	2.76E-04	4.38E-04	2.29E-06	No	No
Selenium	2.1E-06	2.4E-05	1.30E-02	5.61E-03	1.32E-03	2.10E-03	1.10E-05	Yes	Yes
Toluene	--	3.4E-03	1.83E+00	7.95E-01	1.88E-01	2.98E-01	1.56E-03	Yes	Yes
Vanadium	--	2.3E-03	1.24E+00	5.38E-01	1.27E-01	2.01E-01	1.05E-03	No	Yes
Zinc	5.5E-07	2.9E-02	1.56E+01	6.78E+00	1.60E+00	2.54E+00	1.33E-02	No	Yes
Total HAP =	--	--	**1152**	**441**	**104**	**165**	**0.931**	--	--

[a] This summary table is intended for regulatory applicability purposes only.

[b] AP-42 Section 1.3, September 1998, Tables 1.3-8 & 1.3-10 - Distillate Oil Combustion.

[c] AP-42 Section 1.4, July 1998, Natural Gas Combustion.

[d] Based on worst-case emissions between firing all natural gas and firing maximum amount of distillate fuel and the remaining firing natural gas.

[e] AP-42 provides a chromium emission factor for natural gas- and oil-fired external combustion, but does not include guidance for partitioning emissions between the carcinogenic chromium VI (hexavalent chromium) and the chromium III (trivalent chromium). In the EPA's Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units – Final Report to Congress (EPA-453/R-98-004a), chromium emissions from natural gas- and oil-fired units are not included. However, data on speciation of chromium were available from 11 coal- and oil-fired test sites. From these limited data, EPA estimated that the average chromium VI from the coal-fired utilities was 11 percent, and the average from oil-fired utilities was 18 percent. We have conservatively assumed 50 percent of the chromium emissions are chromium VI and the other 50 percent are chromium III.

[f] Polyaromatic Hydrocarbons are the sum of benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indenol(1,2,3,-cd)pyrene, benzo(a)pyrene.

TABLE 4-1

PROCESS WEIGHT LIMIT SUMMARY

Tier II Operating Permit Application
Idaho Falls, Idaho

Unit	Installation Date	Allowable Throughput[1] (lb/day)	Average Throughput[2] (lb/hr/unit)	Process Weight Rule[3]	Process Weight Limit (lb/hr)	Actual Process Weight (lb/hr)
Proctor 1	1965	54,000	750	702a	2.39	0.83
Proctor 2	1965		750	702a	2.39	0.83
Proctor 3	1965		750	702a	2.39	0.83
Flaker Drum Dryer 1	1974	93,600	1,300	702a	3.32	1.96
Flaker Drum Dryer 2	1974		1,300	702a	3.32	1.96
Flaker Drum Dryer 3	2001		1,300	701a	3.32	1.96
Flaker lines 1& 2 vaculift	1981	57,600	2,400	701a	4.80	0.17
Flaker line 3 vaculift	1995	36,000	1,500	701a	3.62	0.14
Bagroom dust vaculift	1995	93,600	3,900	701a	6.42	0.08
Canline vaculift	2002	93,600	3,900	701a	6.42	0.07

1 This is the allowable throughput for all units combined (e.g., the sum of the throughput of all 3 proctor belt dryers must be less than 54,000 lb/day).

2 Assume the total allowable throughput for all units is processed evenly between each unit. The average hourly throughput is divided by the number of units (e.g., each proctor belt dryer's average unit throughput = allowable throughput ÷ 24 ÷ 3 = 54,000 ÷ 24 ÷ 3 = 750 lb/hr/unit.

3 The process weight rule and equations are under IDAPA 58.01.01.700-702.

TABLE 5-1

IDAHO FALLS FACILITY EMISSION SOURCE PARAMETERS

Tier II Operating Permit Application
Idaho Falls, Idaho

Source	Stack Exit Direction	Height (ft)	Actual Inside Diameter[1] (ft)	Model Stack Diameter [2] (m)	Exit Velocity[3] (m/s)	Temperature (°F)
Boiler #1	Vertical	39	3.42	1.04	8.44	390
Boiler #2	Vertical	39	2.58	0.79	5.70	390
Proctor Dryer #1	Horizontal	28	3.0	0.001	0.001	180
Proctor Dryer #2	Horizontal	28	3.0	0.001	0.001	180
Proctor Dryer #3	Horizontal	28	3.0	0.001	0.001	180
Flaker Drum Dryer #1	Vertical	33	3.75	1.14	39.71	110
Flaker Drum Dryer #2	Vertical	34	3.75	1.14	39.71	110
Flaker Drum Dryer #3	Vertical	34	3.75	1.14	35.87	109
Flaker Lines 1 & 2 Vaculift	Horizontal	30	0.8	0.001	0.001	110
Flaker Line 3 Vaculift	Horizontal	30	0.8	0.001	0.001	110
Bagroom Vaculift	Horizontal	30	0.88	0.001	0.001	110
Canline Vaculift	Horizontal	28	0.8	0.001	0.001	Ambient
Plant 1[4]	Horizontal	28	2.5	0.001	0.001	105
Plant 2[4]	Horizontal	28	2.5	0.001	0.001	105
Plant 3[4]	Horizontal	28	2.5	0.001	0.001	105

1 The Vaculift stacks have rectangular cross-sections; the diameters shown are for a circular cross-section with an equivalent area.

2 For all source release points that are oriented horizontally, the exit diameters are set to 0.001 meters to prevent stack tip downwash effects.

3 For all source release points that are oriented horizontally, the exit velocities are set to 0.001 m/s to eliminate plume rise due to exhaust momentum.

4 The Plant sources are building air vents which include emissions from the Bin Dryers 1 and 2; the Waste Plant AMU; the Flaker Room AMU; and the Bag Room AMU.

TABLE 5-2

IDAHO FALLS FACILITY STRUCTURE HEIGHTS

Tier II Operating Permit Application
Idaho Falls, Idaho

Structure	Height	
	(feet)	(meters)
Building #1	19	5.79
Building #2	19	5.79
Building #3	24	7.32
Building #4	26	7.92

TABLE 5-3

IDAHO FALLS FACILITY CRITERIA POLLUTANT MODELING RESULTS

Tier II Operating Permit Application
Idaho Falls, Idaho

Concentrations are in micrograms per cubic meter ($\mu g/m^3$)

Pollutant	Period	Maximum Idaho Falls Contribution	Background Concentration[a]	Max Idaho Falls plus Background	NAAQS
PM10	24 Hour [b]	49	73	122	150
	Annual	12	26	38	50
NO2 [c]	Annual	13	17	30	100
SO2	3 Hour	484	34	518	1,300
	24 Hour	81	26	107	365
	Annual	15	8	23	80
CO	1 Hour	901	3,600	4,501	40,000
	8 Hour	194	2,300	2,494	10,000

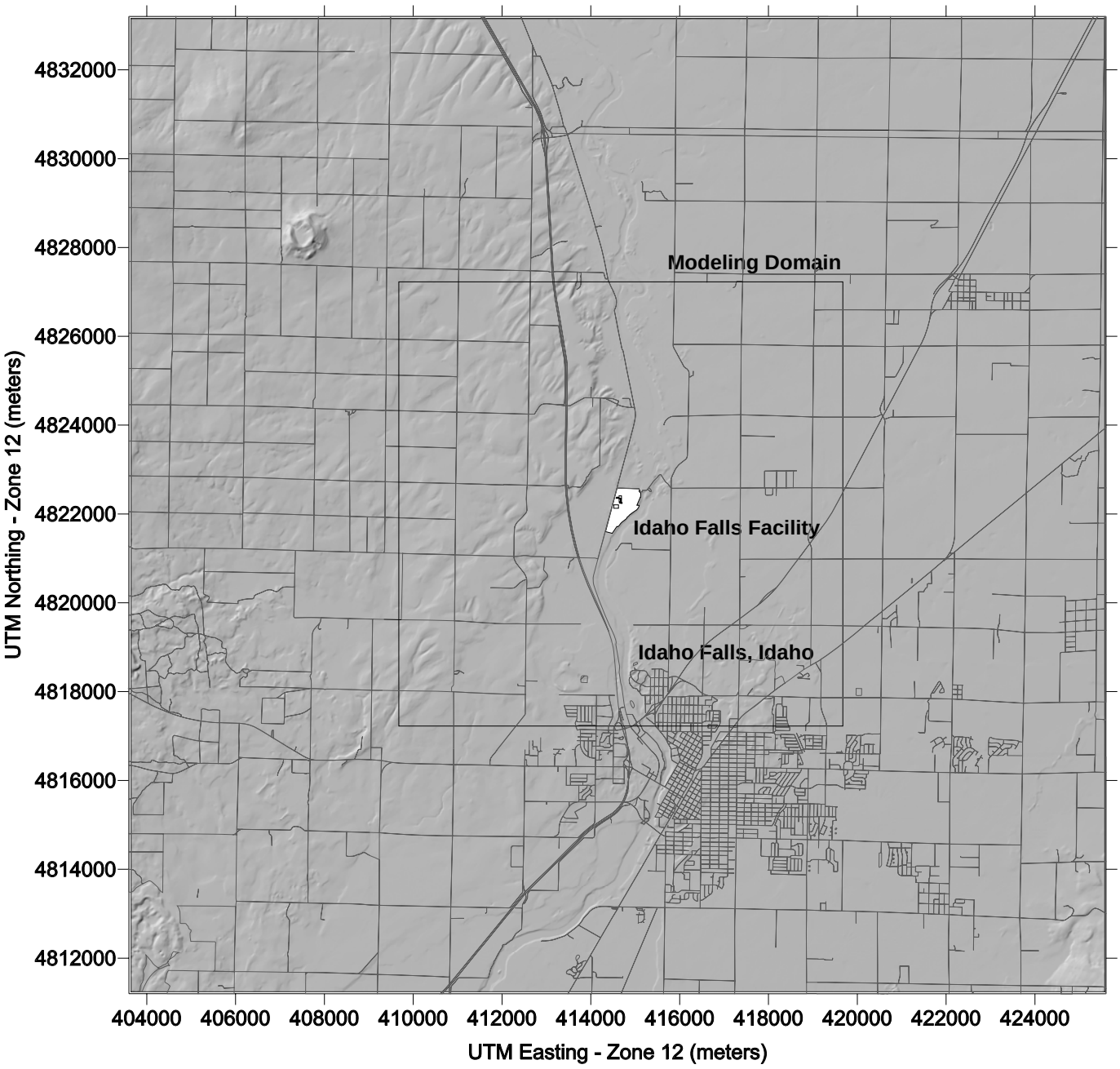
NAAQS = National Ambient Air Quality Standards

a Background concentrations for the modeling analysis were taken from the *IDEQ Background Concentrations for Use in New Source Review Dispersion Modeling* memo, for Rural Agricultural Regional Category (March 14, 2003).

b Maximum 24-hour PM10 concentration is the 6th highest concentration over the five years of modeling.

c Maximum NO2 concentration calculated by multiplying the maximum NOx concentration by 0.75.

FIGURES

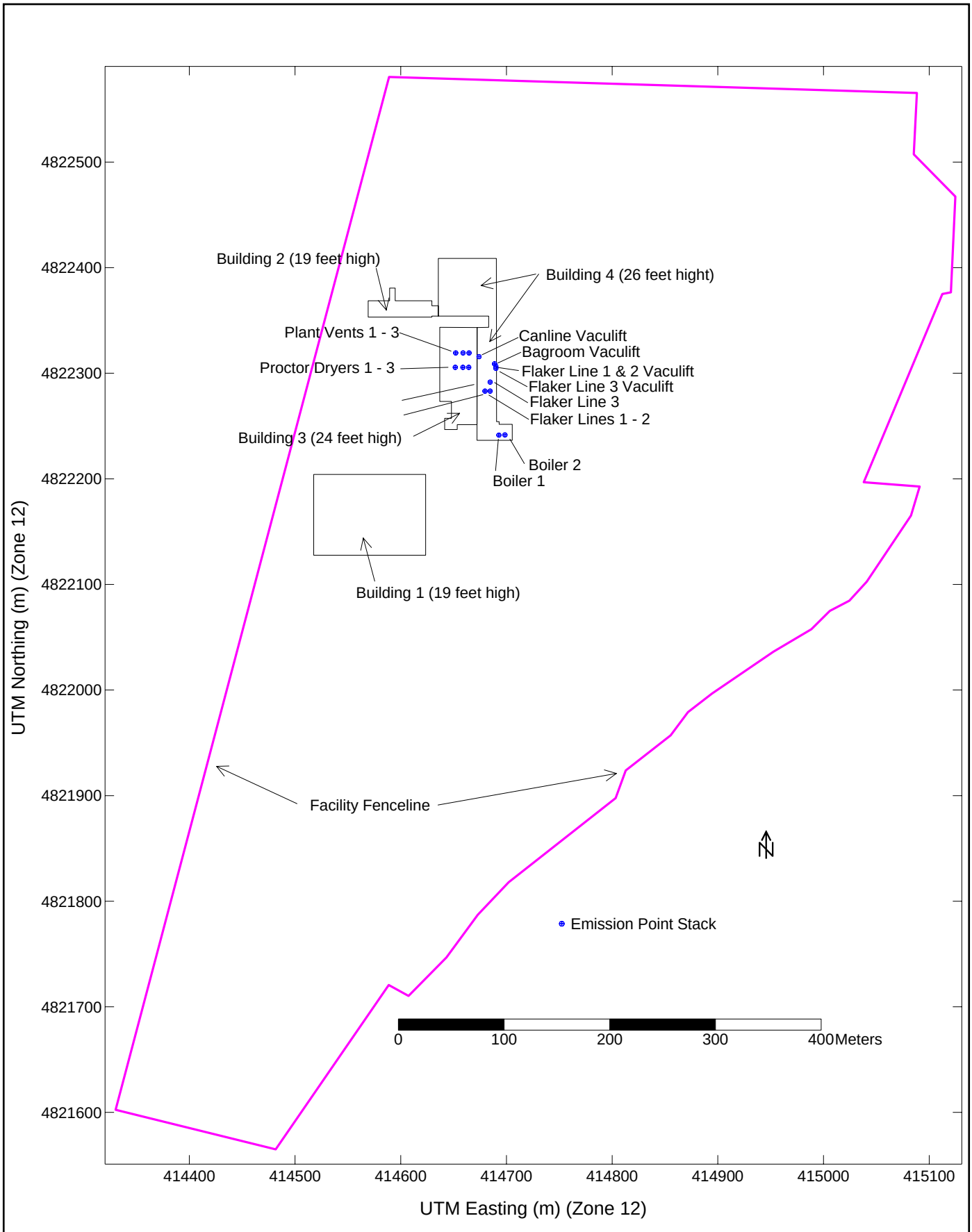


GEOMATRIX

FACILITY LOCATION MAP
Tier II Operating Permit Application
Idaho Falls, Idaho

Project No.
011010

Figure
1-1

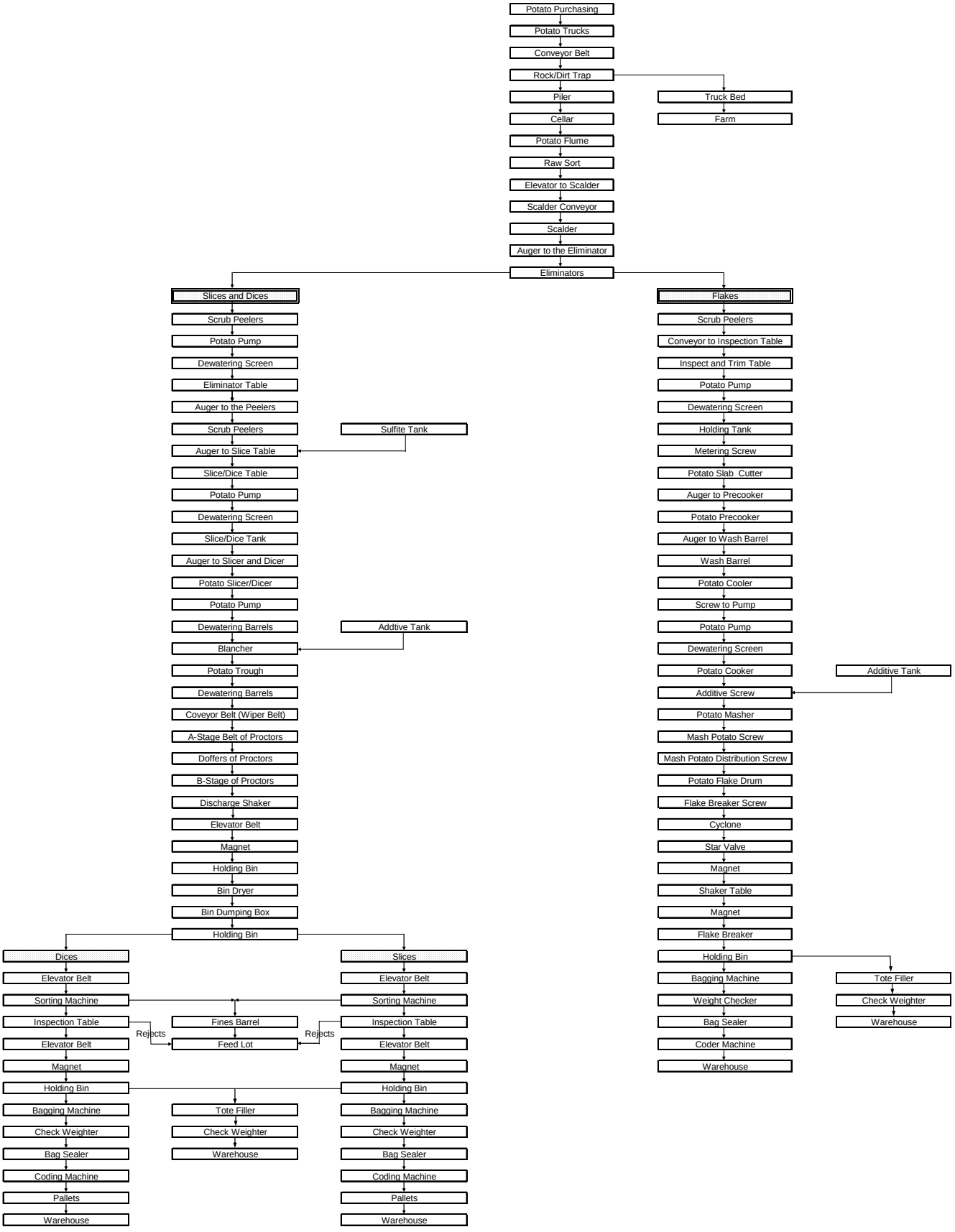


GEOMATRIX

SITE LAYOUT
Tier II Operating Permit Application
Idaho Falls, Idaho

Project No.
11010

Figure
2-1

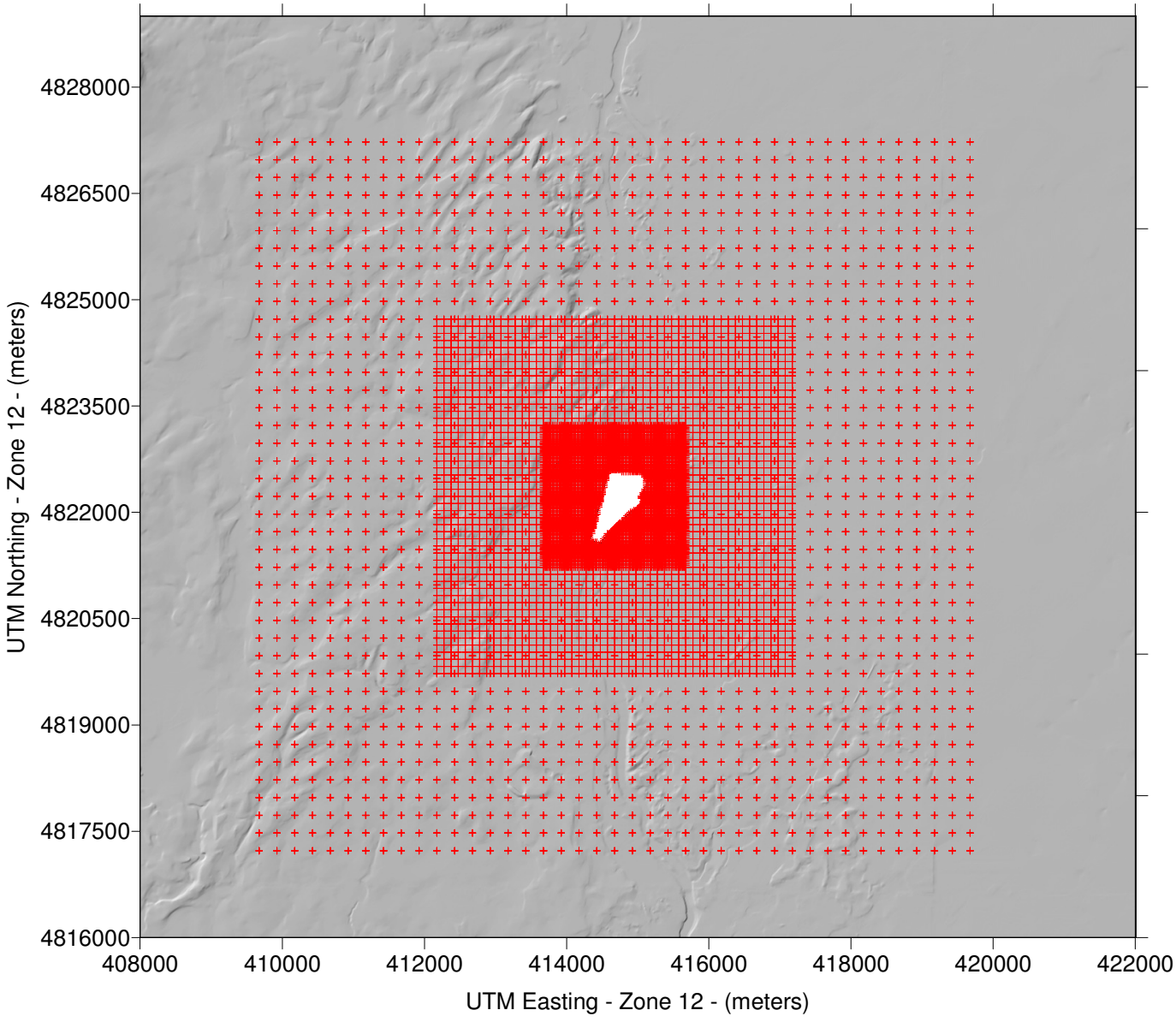


GEOMATRIX

PROCESS FLOW DIAGRAM
Tier II Operating Permit Application
Idaho Falls, Idaho

Project No.
011010.000

Figure
2-2

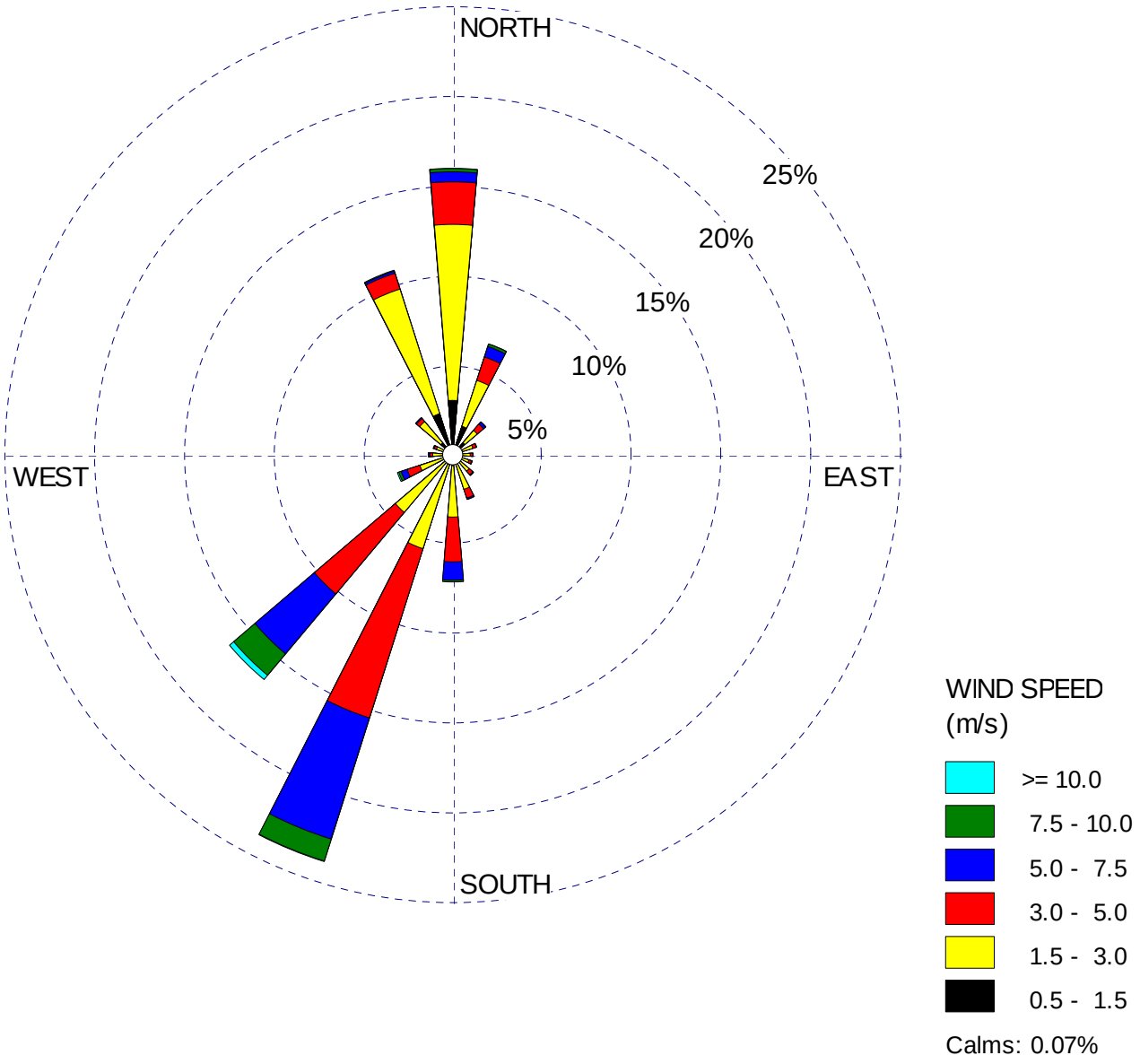


GEOMATRIX

MODELING RECEPTOR LOCATIONS
Tier II Operating Permit Application
Idaho Falls, Idaho

Project No.
011010

Figure
5-1

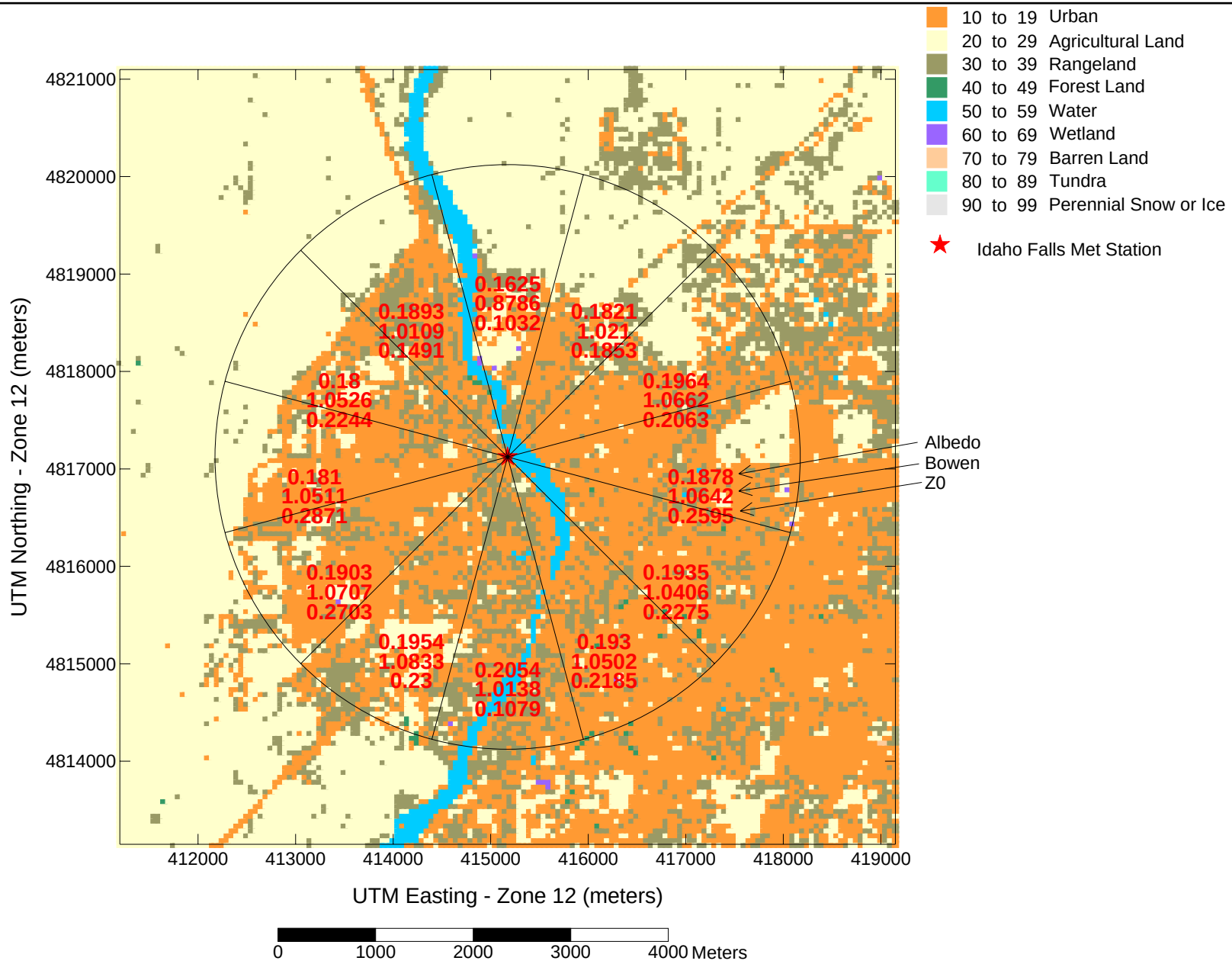


GEOMATRIX

WINDROSE FOR INEEL IDAHO FALLS SITE, 15M LEVEL, 2000-2004
Tier II Operating Permit Application
Idaho Falls, Idaho

Project No.
11010

Figure
5-2



GEOMATRIX

AERMET IDAHO FALLS INEEL SITE LAND-USE ANALYSIS
Tier II Operating Permit Application
Idaho Falls, Idaho

Project No.
11010

Figure
5-3

APPENDICES

APPENDIX A

DEQ's Tier II Operating Permit Forms

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: 208-373-0502

PERMIT TO CONSTRUCT APPLICATION

Applicants, please see instructions on page 2 before filling out the form.

DEQ Staff, please see instructions for handling this form on page 3.

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER

1. Company Name	Idaho Fresh-Pak, Inc.		
2. Facility Name	Idaho Falls facility	3. Facility ID No.	019-00038
4. Brief Project Description - One sentence or less	Tier II Operating Permit Application		

PERMIT APPLICATION TYPE

5. ☐ New Facility ☐ New Source at Existing Facility ☒ Unpermitted Existing Source
☐ Modify Existing Source: Permit No.:_____ Date Issued:_____
☐ Required by Enforcement Action: Case No.:_____

6. ☐ Minor PTC ☐ Major PTC

FORMS INCLUDED

Included	N/A	Forms	DEQ Verify
☒	☐	Form GI – Facility Information	☐
☒	☐	Form EU0 – Emissions Units General (17 forms attached)	☐
☐	☒	Form EU1 - Industrial Engine Information Please Specify number of forms attached: _____	☐
☐	☒	Form EU2 - Nonmetallic Mineral Processing Plants Please Specify number of forms attached: _____	☐
☐	☒	Form EU3 - Spray Paint Booth Information Please Specify number of forms attached: _____	☐
☐	☒	Form EU4 - Cooling Tower Information Please Specify number of forms attached: _____	☐
☒	☐	Form EU5 – Boiler Information Please Specify number of forms attached: 2	☐
☐	☒	Form HMAP – Hot Mix Asphalt Plant Please Specify number of forms attached: _____	☐
☐	☒	Form CBP - Concrete Batch Plant Please Specify number of forms attached: _____	☐
☐	☒	Form BCE - Baghouses Control Equipment	☐
☐	☒	Form SCE - Scrubbers Control Equipment	☐
☒	☐	Forms EI-CP1-EI-CP4 - Emissions Inventory– criteria pollutants (Excel workbook, all 4 worksheets)	☐
☒	☐	PP – Plot Plan (See Figure 2-1 of the application)	☐
☒	☐	Forms MI1-MI4 – Modeling (Excel workbook, all 4 worksheets)	☐
☒	☐	Form FRA – Federal Regulation Applicability	☐

DEQ USE ONLY

Date Received

Project Number

Payment / Fees Included?
Yes ☐ No ☐

Check Number

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

PERMIT TO CONSTRUCT APPLICATION

Please see instructions on page 2 before filling out the form.

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION	
1. Company Name	Idaho Fresh-Pak, Inc.
2. Facility Name (if different than #1)	Idaho Falls facility
3. Facility I.D. No.	019-00038
4. Brief Project Description:	Tier II Operating Permit Application
FACILITY INFORMATION	
5. Owned/operated by: (√ if applicable)	☐ Federal government ☐ County government ☐ State government ☐ City government
6. Primary Facility Permit Contact Person/Title	Mike Eames, Plant Engineer
7. Telephone Number and Email Address	(208)754-8152, MEames@idahoan.com
8. Alternate Facility Contact Person/Title	
9. Telephone Number and Email Address	
10. Address to which permit should be sent	P.O. Box 130, 529 N. 3500 E.
11. City/State/Zip	Lewisville, ID. 83431
12. Equipment Location Address (if different than #9)	6140 West River Road
13. City/State/Zip	Idaho Falls, Idaho 83402
14. Is the Equipment Portable?	☐ Yes ☒ No
15. SIC Code and NAISC Code	SIC: 2034 Secondary SIC (if any): NAICS: 311423
16. Brief Business Description and Principal Product	Dehydrated Potato Processing
17. Identify any adjacent or contiguous facility that this company owns and/or operates	Not Applicable
PERMIT APPLICATION TYPE	
18. Specify Reason for Application	☐ New Facility ☐ New Source at Existing Facility ☐ Modify Existing Source: Permit No.:____ Date Issued: ____ ☒ Unpermitted Existing Source: ☐ Required by Enforcement Action: Case No.:____
CERTIFICATION	
IN ACCORDANCE WITH IDAPA 58.01.01.123 (RULES FOR THE CONTROL OF AIR POLLUTION IN IDAHO), I CERTIFY BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION IN THE DOCUMENT ARE TRUE, ACCURATE, AND COMPLETE.	
19. Responsible Official's Name/Title	Brad Bowen, Vice-President
20. RESPONSIBLE OFFICIAL SIGNATURE	Date: 28 June 07

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	AIR MAKEUP UNIT - BAG ROOM
2. EU ID Number:	AMU-BR
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	UNKNOWN
5. Model:	UNKNOWN
6. Maximum Capacity:	5 MMBTU/HR - NATURAL GAS-FIRED
7. Date of Construction:	1971
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	AIR MAKEUP UNIT - FLAKER ROOM
2. EU ID Number:	AMU-FR
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	UNKNOWN
5. Model:	UNKNOWN
6. Maximum Capacity:	2.5 MMBTU/HR - NATURAL GAS-FIRED
7. Date of Construction:	1971
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

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1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

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IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	AIR MAKEUP UNIT - WASTE PLANT
2. EU ID Number:	AMU-WP
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	UNKNOWN
5. Model:	UNKNOWN
6. Maximum Capacity:	2.5 MMBTU/HR - NATURAL GAS-FIRED
7. Date of Construction:	1971
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

DEQ AIR QUALITY PROGRAM
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For assistance: (208) 373-0502

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IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	BIN DRYER #1
2. EU ID Number:	BIN1
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	KING
5. Model:	UNKNOWN
6. Maximum Capacity:	2.5 MMBTU/HR - NATURAL GAS-FIRED
7. Date of Construction:	1971
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

DEQ AIR QUALITY PROGRAM
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For assistance: (208) 373-0502

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IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	BIN DRYER #2
2. EU ID Number:	BIN2
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	UNKNOWN
5. Model:	UNKNOWN
6. Maximum Capacity:	3.8 MMBTU/HR - NATURAL GAS-FIRED
7. Date of Construction:	1971
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	BAG ROOM VACULIFT
2. EU ID Number:	BR-VL
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	VACULIFT
5. Model:	UNKNOWN
6. Maximum Capacity:	550 CFM
7. Date of Construction:	1995
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

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For assistance: (208) 373-0502

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IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	CANLINE VACULIFT
2. EU ID Number:	CL-VL
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	VACULIFT
5. Model:	UNKNOWN
6. Maximum Capacity:	450 CFM
7. Date of Construction:	2002
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

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IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	FLAKER LINE #1
2. EU ID Number:	FL1
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	BLAW-KNOX
5. Model:	UNKNOWN
6. Maximum Capacity:	SEE BELOW
7. Date of Construction:	1974
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☒ Production Limit(s):	FLAKER LINES 1, 2, AND 3 TO 93,600 LB PRODUCT/DAY
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	COMMERCIAL DEMAND

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	FLAKER LINE #2
2. EU ID Number:	FL2
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	BLAW-KNOX
5. Model:	UNKNOWN
6. Maximum Capacity:	SEE BELOW
7. Date of Construction:	1974
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☒ Production Limit(s):	FLAKER LINES 1, 2, AND 3 TO 93,600 LB PRODUCT/DAY
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	COMMERCIAL DEMAND

DEQ AIR QUALITY PROGRAM
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Boise, ID 83706
For assistance: (208) 373-0502

PERMIT TO CONSTRUCT APPLICATION

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	FLAKER LINE #3
2. EU ID Number:	FL3
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	Idaho Steel
5. Model:	UNKNOWN
6. Maximum Capacity:	SEE BELOW
7. Date of Construction:	2001
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☒ Production Limit(s):	FLAKER LINES 1, 2, AND 3 TO 93,600 LB PRODUCT/DAY
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	COMMERCIAL DEMAND

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

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For assistance: (208) 373-0502

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	FLAKER LINES 1 AND 2 VACULIFT
2. EU ID Number:	FL1&2-VL
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	VACULIFT
5. Model:	UNKNOWN
6. Maximum Capacity:	1,140 CFM
7. Date of Construction:	1981
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

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For assistance: (208) 373-0502

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	FLAKER LINE 3 VACULIFT
2. EU ID Number:	FL3-VL
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	VACULIFT
5. Model:	UNKNOWN
6. Maximum Capacity:	990 CFM
7. Date of Construction:	1995
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

DEQ AIR QUALITY PROGRAM
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For assistance: (208) 373-0502

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	PROCTOR BELT DRYER #1
2. EU ID Number:	P1
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	PROCTOR AND SCHWARTZ
5. Model:	UNKNOWN
6. Maximum Capacity:	SEE BELOW
7. Date of Construction:	1965
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☒ Production Limit(s):	PROCTOR LINES 1, 2, AND 3 TO 54,000 LB PRODUCT/DAY
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	COMMERCIAL DEMAND

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	PROCTOR BELT DRYER #2
2. EU ID Number:	
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	PROCTOR AND SCHWARTZ
5. Model:	UNKNOWN
6. Maximum Capacity:	SEE BELOW
7. Date of Construction:	1965
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☒ Production Limit(s):	PROCTOR LINES 1, 2, AND 3 TO 54,000 LB PRODUCT/DAY
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	COMMERCIAL DEMAND

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

PERMIT TO CONSTRUCT APPLICATION

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	PROCTOR BELT DRYER #3
2. EU ID Number:	P3
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	PROCTOR AND SCHWARTZ
5. Model:	UNKNOWN
6. Maximum Capacity:	SEE BELOW
7. Date of Construction:	1965
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	7200 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☒ Production Limit(s):	PROCTOR LINES 1, 2, AND 3 TO 54,000 LB PRODUCT/DAY
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	COMMERCIAL DEMAND

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	LARGE FUEL TANK
2. EU ID Number:	LT
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	UNKNOWN
5. Model:	UNKNOWN
6. Maximum Capacity:	200,000 GALLONS
7. Date of Construction:	1974
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	8760 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	SMALL FUEL TANK
2. EU ID Number:	ST
3. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	UNKNOWN
5. Model:	UNKNOWN
6. Maximum Capacity:	14,400 GALLONS
7. Date of Construction:	1981
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	8760 HOURS/YEAR
19. Maximum Operation	8760 HOURS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

PERMIT TO CONSTRUCT APPLICATION

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
Company Name: Idaho Fresh-Pak, Inc.	Facility Name: Idaho Falls facility	Facility ID No: 019-00038
Brief Project Description:	Tier II Operating Permit Application	

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

Boiler (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

1. Type of Request	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a unit with Permit #:	
2. Use of Boiler:	☒ % Used For Process ☒ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other:	
3. Boiler ID Number: BLR_1	4. Rated Capacity: ☒ 61.6 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
5. Construction Date: 1974	6. Manufacturer: Cleaver Brooks	7. Model: WT200x-CN5
8. Date of Modification (if applicable): 1981	9. Serial Number (if available):	10. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS

11. Fuel Type	☒ Diesel Fuel (#2) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☒ Other Fuels (unit:gal /hr)
12. Full Load Consumption Rate	449.6	61,600		449.6
13. Actual Consumption Rate		226.968 mmcf/yr		
14. Fuel Heat Content (Btu/unit, LHV)	137 MMBtu/mgal	1000 Btu/cf		137 MMBtu/mgal
15. Sulfur Content wt%	0.5	0		0.005
16. Ash Content wt%	negligible	N/A		0.02

STEAM DESCRIPTION AND SPECIFICATIONS

17. Steam Heat Content	N/A	N/A		N/A
18. Steam Temperature (°F)	N/A	N/A		N/A
19. Steam Pressure (psi)	N/A	N/A		N/A
20. Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE

21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.): 2,640,000 gallons distillate fuel per year
22. Operating Schedule (hours/day, months/year, etc.): not applicable

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

PERMIT TO CONSTRUCT APPLICATION

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

Boiler (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

1. Type of Request	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a unit with Permit #:	
2. Use of Boiler:	☒ % Used For Process ☒ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other:	
3. Boiler ID Number: BLR_2	4. Rated Capacity: ☒ 26.7 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
5. Construction Date: 1974	6. Manufacturer: Cleaver Brooks	7. Model: L34
8. Date of Modification (if applicable):	9. Serial Number (if available):	10. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS

11. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
12. Full Load Consumption Rate		26,700		
13. Actual Consumption Rate		139.673 mmcf/yr		
14. Fuel Heat Content (Btu/unit, LHV)		1000 Btu/cf		
15. Sulfur Content wt%		0		
16. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

17. Steam Heat Content		N/A		
18. Steam Temperature (°F)	N/A	N/A		
19. Steam Pressure (psi)	N/A	N/A		
20. Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE

21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.): Not Applicable

22. Operating Schedule (hours/day, months/year, etc.): Not Applicable

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

PERMIT TO CONSTRUCT APPLICATION

Company Name:	**Idaho Fresh-Pak, Inc.**
Facility Name:	Idaho Falls Facility
Facility ID No.:	019-00038
Brief Project Description:	Tier II Operating Permit Application

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - POINT SOURCES

		3.											
1.	2.	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	Stack ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Source(s)													
Boiler 1	BLR_1	5.10	22.34	31.92	93.91	13.49	52.95	10.35	45.33	0.34	1.48	--	--
Boiler 2	BLR_2	0.41	1.78	0.02	0.07	4.01	17.54	4.49	19.65	0.15	0.64	--	--
Flaker Lines 1 and 2 Vaculift	FL_1&2	0.17	0.73	--	--	--	--	--	--	--	--	--	--
Flaker Line 3 Vaculift	FL_3	0.14	0.63	--	--	--	--	--	--	--	--	--	--
Bag Room Vaculift	BR_VAC	0.08	0.35	--	--	--	--	--	--	--	--	--	--
Canline Vaculift	CL_VAC	0.07	0.29	--	--	--	--	--	--	--	--	--	--
Proctor Belt Dryer 1	PROCT_1	0.83	3.61	--	--	--	--	--	--	--	--	--	--
Proctor Belt Dryer 2	PROCT_2	0.83	3.61	--	--	--	--	--	--	--	--	--	--
Proctor Belt Dryer 3	PROCT_3	0.83	3.61	--	--	--	--	--	--	--	--	--	--
Flaker Line 1 Dryer	FLAKE1	1.96	8.60	--	--	--	--	--	--	--	--	--	--
Flaker Line 1 Dryer	FLAKE2	1.96	8.60	--	--	--	--	--	--	--	--	--	--
Flaker Line 1 Dryer	FLAKE3	1.96	8.60	--	--	--	--	--	--	--	--	--	--
Bin Dryer 1	PLANT1-3	0.04	0.17	0.00	0.01	0.38	1.64	0.42	1.84	0.01	0.06	--	--
Bin Dryer 2	PLANT1-3	0.06	0.25	0.00	0.01	0.57	2.50	0.64	2.80	0.02	0.09	--	--
AMU (Waste Plant)	PLANT1-3	0.04	0.17	0.00	0.01	0.38	1.64	0.42	1.84	0.01	0.06	--	--
AMU (Flaker Room)	PLANT1-3	0.04	0.17	0.00	0.01	0.38	1.64	0.42	1.84	0.01	0.06	--	--
AMU (Bag Room)	PLANT1-3	0.08	0.33	0.00	0.01	0.75	3.29	0.84	3.68	0.03	0.12	--	--
Large Tank	LT	--	--	--	--	--	--	--	--	0.01	0.03	--	--
Small Tank	ST	--	--	--	--	--	--	--	--	0.00	0.01	--	--
Total		14.57	63.83	31.95	94.02	19.94	81.20	17.57	76.97	0.58	2.56		

DEQ AIR QUALITY PROGRAM
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PERMIT TO CONSTRUCT APPLICATION

Company Name:	Idaho Fresh-Pak, Inc.
Facility Name:	Idaho Falls Facility
Facility ID No.:	019-00038
Brief Project Description:	Tier II Operating Permit Application

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - FUGITIVE SOURCES

		3.											
1.	2.	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Fugitive Source Name	Fugitive ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Fugitive Source(s)													
Not Applicable													
Total													

DEQ AIR QUALITY PROGRAM
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PERMIT TO CONSTRUCT APPLICATION

Company Name:	Idaho Fresh-Pak, Inc.
Facility Name:	Idaho Falls Facility
Facility ID No.:	019-00038
Brief Project Description:	Tier II Operating Permit Application

SUMMARY OF EMISSIONS INCREASE (PROPOSED PTE - PREVIOUSLY MODELED PTE) - POINT SOURCES

		3.											
1.	2.	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	Stack ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Source(s)													
Not Applicable													
Total													

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton Boise, ID 83706 **For assistance: (208) 373-0502**	**PERMIT TO CONSTRUCT APPLICATION**
Company Name:	Idaho Fresh-Pak, Inc.	
Facility Name:	Idaho Falls Facility	
Facility ID No.:	019-00038	
Brief Project Description:	Tier II Operating Permit Application	

SUMMARY OF EMISSIONS INCREASE (PROPOSED PTE - PREVIOUSLY MODELED PTE) - FUGITIVE SOURCES

		3. Air Pollutant Maximum Change in Emissions Rate (lbs/hr or t/yr)											
1.	2.	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Fugitive Source Name	**Fugitive ID**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
Fugitive Source(s)													
Not Applicable													
Total													

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton Boise, ID 83706 **For assistance: (208) 373-0502**	**PERMIT TO CONSTRUCT APPLICATION**
Company Name:	Idaho Fresh-Pak, Inc.	
Facility Name:	Idaho Falls Facility	
Facility ID No.:	019-00038	
Brief Project Description:	Tier II Operating Permit Application	

SUMMARY OF AIR IMPACT ANALYSIS RESULTS - CRITERIA POLLUTANTS

		1.		2.	3.	4.		5.
Criteria Pollutants	**Averaging Period**	**Significant Impact Analysis Results (µg/m3)**	**Significant Contribution Level (µg/m3)**	**Full Impact Analysis Results (µg/m3)**	**Background Concentration (µg/m3)**	**Total Ambient Impact (µg/m3)**	**NAAQS (µg/m3)**	**Percent of NAAQS**
PM_{10}	24-hour [a]	--	5	49	73	122	150	81%
	Annual	--	1	12	26	38	50	76%
SO_2	3-hr	--	25	484	34	518	1300	40%
	24-hr	--	5	81	26	107	365	29%
	Annual	--	1	15	8	23	80	29%
NO_2 [b]	Annual	--	1	13	17	30	100	30%
CO	1-hr	--	2000	901	3,600	4,501	10000	45%
	8-hr	--	500	194	2,300	2,494	40000	6%

a - Maximum 24-hour PM10 concentration is the 6th highest concentration over five years of modeling.

b - Maximum NO2 concentration calculated by multiplying maximum modeled NOx concentration by 0.75.

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton Boise, ID 83706 **For assistance: (208) 373-0502**	**PERMIT TO CONSTRUCT APPLICATION**
Company Name:	Idaho Fresh-Pak, Inc.	
Facility Name:	Idaho Falls Facility	
Facility ID No.:	019-00038	
Brief Project Description:	Tier II Operating Permit Application	

POINT SOURCE STACK PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	.7	8.	9.	10.
Emissions units	**Stack ID**	**UTM Easting (m)**	**UTM Northing (m)**	**Base Elevation (m)**	**Stack Height (m)**	**Modeled Diameter (m)**	**Stack Exit Temperature (K)**	**Stack Exit Flowrate (acfm)**	**Stack Exit Velocity (m/s)**	**Stack orientation (e.g., horizontal, rain cap)**
Point Source(s)										
Boiler 1	BLR_1	414,692.88	4,822,241.40	1,443.00	11.89	1.04	472.04	15,268.00	8.44	Vertical
Boiler 2	BLR_2	414,698.61	4,822,241.60	1,443.00	11.89	0.79	472.04	5,866.00	5.70	Vertical
Flaker Lines 1 and 2 Vaculift	FL_1&2	414,690.01	4,822,306.48	1,445.00	9.14	0.001	316.48	1,140.00	0.001	Horizontal
Flaker Line 3 Vaculift	FL_3	414,690.01	4,822,304.71	1,445.00	9.14	0.001	316.48	990.00	0.001	Horizontal
Bag Room Vaculift	BR_VAC	414,688.81	4,822,308.90	1,445.00	9.14	0.001	316.48	550.00	0.001	Horizontal
Canline Vaculift	CL_VAC	414,674.05	4,822,315.70	1,444.00	8.53	0.001	0.00	450.00	0.001	Horizontal
Proctor Belt Dryer 1	PROCT_1	414,651.61	4,822,305.60	1,445.00	8.53	0.001	355.37	7,210.00	0.001	Horizontal
Proctor Belt Dryer 2	PROCT_2	414,658.83	4,822,305.60	1,445.00	8.53	0.001	355.37	7,634.00	0.001	Horizontal
Proctor Belt Dryer 3	PROCT_3	414,664.38	4,822,305.60	1,445.00	8.53	0.001	355.37	4,241.00	0.001	Horizontal
Flaker Line 1 Dryer	FLAKE1	414,684.60	4,822,283.09	1,445.00	10.06	1.14	316.48	26,315.00	39.71	Vertical
Flaker Line 1 Dryer	FLAKE2	414,679.72	4,822,283.09	1,445.00	10.36	1.14	316.48	26,315.00	39.71	Vertical
Flaker Line 1 Dryer	FLAKE3	414,684.60	4,822,291.62	1,445.00	10.36	1.14	315.93	26,315.00	35.87	Vertical
Plant Exhaust 1	PLANT1	414,652.05	4,822,319.24	1,444.00	8.53	0.001	313.71	4,420.00	0.001	Horizontal
Plant Exhaust 2	PLANT2	414,658.97	4,822,319.24	1,444.00	8.53	0.001	313.71	4,420.00	0.001	Horizontal
Plant Exhaust 3	PLANT3	414,664.64	4,822,319.24	1,444.00	8.53	0.001	313.71	4,420.00	0.001	Horizontal

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton Boise, ID 83706 **For assistance: (208) 373-0502**	**PERMIT TO CONSTRUCT APPLICATION**
Company Name:	Idaho Fresh-Pak, Inc.	
Facility Name:	Idaho Falls Facility	
Facility ID No.:	019-00038	
Brief Project Description:	Tier II Operating Permit Application	

FUGITIVE SOURCE PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	**Stack ID**	**UTM Easting (m)**	**UTM Northing (m)**	**Base Elevation (m)**	**Release Height (m)**	**Easterly Length (m)**	**Northerly Length (m)**	**Angle from North (°)**	**Initial Vertical Dimension (m)**	**Initial Horizontal Dimension (m)**
Area Source(s)										
	Not Applicable									
Volume Source(s)										
	Not Applicable									

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

PERMIT TO CONSTRUCT APPLICATION

Company Name:	Idaho Fresh-Pak, Inc.
Facility Name:	Idaho Falls Facility
Facility ID No.:	019-00038
Brief Project Description:	Tier II Operating Permit Application

BUILDING AND STRUCTURE INFORMATION

1.	2.	3.	4.	5.	6.	7.
Building ID Number	**Length (ft)**	**Width (ft)**	**Base Elevation (m)**	**Building Height (m)**	**Number of Tiers**	**Description/Comments**
Building 1	347.00	251.00	1445.00	5.79	1	
Building 2	197.00	50.00	1445.00	5.79	1	
Building 3	79.00	316.00	1445.00	7.32	1	
Building 4	180.00	564.00	1445.00	7.92	1	

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

PERMIT TO CONSTRUCT APPLICATION

IDENTIFICATION		
Company Name:	Facility Name:	Facility ID No:
Idaho Fresh-Pak, Inc.	Idaho Falls facility	019-00038
Brief Project Description:	Tier II Operating Permit Application	

APPLICABILITY DETERMINATION

1. Will this project be subject to 1990 CAA Section 112(g)? (Case-by-Case MACT)	☒ NO	☐ YES*	☐ DON'T KNOW
	* If YES then applicant must submit an application for a case-by-case MACT determination [IAC 567 22-1(3)"b" (8)]		
2. Will this project be subject to a New Source Performance Standard? (40 CFR part 60)	☒ NO	☐ YES*	☐ DON'T KNOW
	*If YES please identify sub-part: _____		
3. Will this project be subject to a MACT (Maximum Achievable Control Technology) regulation? (40 CFR part 63) THIS ONLY APPLIES IF THE PROJECT EMITS A HAZARDOUS AIR POLLUTANT – SEE TABLE A FOR LIST	☒ NO	☐ YES*	☐ DON'T KNOW
	*If YES please identify sub-part: _____		
4. Will this project be subject to a NESHAP (National Emission Standards for Hazardous Air Pollutants) regulation? (40 CFR part 61)	☒ NO	☐ YES*	☐ DON'T KNOW
	*If YES please identify sub-part: _____		
5. Will this project be subject to PSD (Prevention of Significant Deterioration)? (40 CFR section 52.21)	☒ NO	☐ YES	☐ DON'T KNOW
6. Was netting done for this project to avoid PSD?	☒ NO	☐ YES*	☐ DON'T KNOW
	*If YES please attach netting calculations		

IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS CALL 1-208-373-0502

APPENDIX B

Potential Emission Rate Calculations

POTENTIAL EMISSION RATE CALCULATIONS
Tier II Operating Permit Application
Idaho Falls, Idaho

	Stacks	Heat input	Heat input	Throughput	NOx		CO		SO2		PM10		VOC		Comments
		MMBtu/hr	MMBtu/yr	lb/day	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Boiler 1 distillate	1	61.6	361,680	-	13.49	39.60	4.50	13.20	31.92	93.72	2.97	8.71	0.09	0.26	2,640,000 gal/year distillate fuel, 0.5%S
Boiler 1 biofuel			539,616	-	6.58	28.82	2.76	12.09	0.13	0.57	5.10	22.34	0.09	0.40	firing n.g. at max annual heat input.
Boiler 1 nat gas				-	9.24	40.47	10.35	45.33	0.04	0.16	0.94	4.10	0.34	1.48	firing biofuel at max annual heat input
Boiler 1 distillate composite (distillate with n.g. or biofuel)			-	-	-	52.95	-	28.15	-	93.91	-	16.08	-	0.75	distillate firing 5,871 hr/yr and the max emissions of firing 2,877 hours of natural gas or biofuel.
Boiler 2 nat gas	1	26.7	233,892	-	4.01	17.54	4.49	19.65	0.02	0.07	0.41	1.78	0.15	0.64	firing n.g. at max annual heat input.
Belt dryer 1 (Proctor 1)	1	-	-	54,000	0	0	0	0	0	0	0.8251	3.61	0	0	54,000 lb product/day
Belt dryer 2 (Proctor 2)	1	-	-		0	0	0	0	0	0	0.83	3.61	0	0	2.20 lb PM10/ton
Belt dryer 3 (Proctor 3)	1	-	-		0	0	0	0	0	0	0.83	3.61	0	0	
Flaker line 1	1	-	-	93,600	0	0	0	0	0	0	1.96	8.60	0	0	93,600 lb product/day
Flaker line 2	1	-	-		0	0	0	0	0	0	1.96	8.60	0	0	3.02 lb PM10/ton
Flaker line 3	1	-	-		0	0	0	0	0	0	1.96	8.60	0	0	
Flaker lines 1& 2 vaculift	1	-	-	-	0	0	0	0	0	0	0.17	0.73	0	0	1,140 cfm. Assume 0.017 gr/acf
Flaker line 3 vaculift	1	-	-	-	0	0	0	0	0	0	0.14	0.63	0	0	990 cfm. Assume 0.017 gr/acf
Bin Dryer 1	indoors	2.5	-	-	0.38	1.64	0.42	1.84	0.002	0.01	0.04	0.17	0.01	0.06	
Bin Dryer 2	indoors	3.8	-	-	0.57	2.50	0.64	2.80	0.002	0.01	0.06	0.25	0.02	0.09	
Bagroom dust vaculift	1	-	-	-	0	0	0	0	0	0	0.08	0.35	0	0	550 cfm. Assume 0.017 gr/acf
Canline vaculift	1	-	-	-	0	0	0	0	0	0	0.07	0.29	0	0	450 cfm. Assume 0.017 gr/acf
Fresh Air Make-Up Fan (Waste Plant)	indoors	2.5	-	-	0.38	1.64	0.42	1.84	0.002	0.01	0.04	0.17	0.01	0.06	
Fresh Air Make-Up Fan (Flaker Room)	indoors	2.5	-	-	0.38	1.64	0.42	1.84	0.002	0.01	0.04	0.17	0.01	0.06	
Fresh Air Make-Up Fan (Bag Room)	indoors	5	-	-	0.75	3.29	0.84	3.68	0.003	0.01	0.08	0.33	0.03	0.12	
Large Tank (200,000 gallons)	-	-	-	2,640,000	0	0	0	0	0	0	0	0	0.007	0.03	
Small Tank (14,400 gallons)	-	-	-	2,640,000	0	0	0	0	0	0	0	0	0.002	0.01	
				Total PTE =	**19.94**	**81.20**	**17.57**	**76.97**	**31.95**	**94.02**	**14.57**	**63.83**	**0.58**	**2.56**	

Tan indicates proposed limits

Combustion Emission Factors:		NOx	CO	SO2	PM10	VOC	**Source:**
Distillate Emission Factors	lb/1000 gal	30	10	71	6.6	0.2	9/98 AP42 Section 1.3 - Uncontrolled <100 MMBtu/hr (CO and PM10 EFs are doubled, NOx EF multiplied by 1.5)
Biofuel Emission Factors	lb/MMBtu	0.1068	0.0448	0.0021	0.0828	0.0015	Biofuels Technical Data - Appendix E, (CO and PM10 EFs are doubled, NOx EF multiplied by 1.5)
Natural Gas Emission Factors	lb/MMscf	150	168	0.6	15.2	5.5	7/98 AP42 Section 1.2 - Uncontrolled <100 MMBtu/hr. (CO and PM10 EFs are doubled, NOx EF multiplied by 1.5)
Process Emission Factors:							
Belt Dryer Emission Factors	lb/ton product	--	--	--	2.20	--	Source Test Data from Lewisville, ID plant Proctor Lines. PM10 emission factor times four.
Flaker Line Emission Factors	lb/ton product	--	--	--	3.02	--	Source Test Data from Lewisville, ID plant Flaker Line. PM10 emission factor times four.

Assumptions:

137	MMBtu/1000 gallons distillate	
0.5	percent sulfur in distillate, maximum allowable after 1974 per IDAPA 58.01.01.728.02.	
1000	Btu/scf natural gas	
0.017	grains/cubic foot for cyclones	Based on cyclone testing at Lewisville facility multiplied by 10 for conservatism

APPENDIX C

Biofuels Technical Data

Rendered fats possible solution to high fuel costs

Table 1. Emission Factor Pollutant

Fuel	CO_2	Lead	N_2O (low) NOx burner)	N_2O	PM-Total Condensable	PM	PM-Filterable	SO_2	TOC	VOC
Natural Gas (lb./10^6scf)pounds per million standard cubic ft.	120,000	0.0005	2.2	0.64	7.6	5.7	1.9	0.6	11	5.5
No. 2 Oil Fired lb./M gal.	5	-	20.54	-	2	2	2	71	-	0.252
Converted to lb./MM Btu assuming 140,000 Btu/gal.	0.0357	-	0.1429	-	0.0143	0.0143	0.0143	0.5071	-	0.0018
No. 6 Oil Fired lb./M gal.	5	-	55	-	10	10	10	78.5	-	1.28
Converted to lb./MM Btu assuming 150,000 Btu/gal.	0.0333	-	0.3667	-	0.0667	0.667	0.667	0.5233	-	0.0085

Please Note: The above table is extrapolated from the tables as supplied by the Iowa Department of Natural Resources, Air Quality Board and are contained within the full reference from the U.S. Federal Environmental Protection Agency AP-42 Publication (7/98).

The gross calorific and net calorific values for tallow ...s 39,090 kJ/kg and 36,200 respectively and for HFO ... kJ/kg and 38,830 respectively. These values represent ...2 percent the gross heating value and 90.5 percent the net heating value for tallow as compared to HFO.

Choice White Grease/Lard

Work completed at Penn State University reported the data in Tables 3 and 4 on fuel analysis, combustion, and emissions data, all of which are very favorable when compared to the No. 6 fuel oil standard.

Poultry Fat

Data summarized on the use of poultry fat as a burner fuel for replacement for both natural gas and fuel oil indicates very satisfactory performance and, in general, provides for a cleaner burning fuel than the comparative.

Average Fuel Characteristics of Poultry Fat

Carbon	73.6%
Hydrogen	7.68%
Nitrogen	0.06%
Oxygen	18.6%
Ash	0.1%
Sulfur	<.02%
Heating Value BTU/lb. (range 16,230 to 16,910)	16,790

Note: Due to the low analysis of both sulfur and ...n content of fat, the production of nitric oxide/nit... n dioxide and sulfur dioxide emissions is expected to be extremely favorable for the emissions data as determined by stack and chamber analyses.

Table 2. Particulate Emissions

Fuel		Tallow	HFO
Duration	mins	60	60
Flue Temperature	°C	246	239
Mean Gas Velocity	m/s	22.3	21.4
Volume Flow Rate of Gases			
(a) At Duct Conditions	m^3/hr.	27391	26410
(b) At STP	m^3/hr.	14671	14324
(c) At STP, 3%O_2, dry	m^3/hr.	-	11960
(d) At STP, 11%O_2, dry	m^3/hr.	20273	21596
Mass Flow Rate of Gases	kg hr.-1	18340	17905
Concentration of Particulates in Waste Gases			
(a) At Duct Conditions	mg/m^3	8	95
(b) At STP, 3%O_2, dry	mg/m^3	-	216
(c) At STP, 11%O_2, dry	mg/m^3	10	116
Particulate Burden	kg/hr.	0.20	2.96
Carbon Content of Dust	%	<1.0	84.4

(a) m^3/hr. Mass flow rate of gases kg hr. 1
(b) m^3/hr. Concentration a b c mg/m^3
(c) m^3/hr. Particulate kg/hr.
(d) m^3/hr.

Emissions Summary

Data is available for firing rates ranging from 100 percent thru 30 percent at 10 percent increments. Stack temperature averaged 474 degrees Fahrenheit (F) at the 100

Continued on page 20

Fuel *Continued from page 19*

percent firing rate and 352 degrees F at the 30 percent rate. There appeared to be little difference in the emissions data through an apparent reduction in NO_x at the lower firing rate (stack temperature). As previous, the lack of nitrogen components in fat indicates that the generation of any NO_x is the result of combustion.

	100% Firing Rate	30% Firing Rate
Carbon Monoxide	0 ppm	0 ppm
Carbon Dioxide	8.6%	6.5%
Hydrocarbons	0 ppm	0 ppm
Excess Air	16%	51%
Nitric Oxide (NO_x)	97 ppm	52 ppm
Nitrogen Dioxide	0 ppm	0 ppm
Sulfur Dioxide (SO_x)	0 ppm	0 ppm

In summary, poultry fat can be considered to be an extremely environmentally friendly alternative burner fuel.

Yellow Grease

Stack tests completed and reported have likewise illustrated an environmentally friendly fuel source as derived from used cooking oils and restaurant grease. Similarly the fuel and burn characteristics have been entirely satisfactory. The following is illustrative of data using 100 percent recycled yellow grease with no additives.

Broiler/Burner Description
Manufacturer: Nebraska Boiler Company
Type Boiler: Water Tube "D" style package steam generating boiler
Serial Number: 2D-1719
Date of Manufacture: 1976
Burner Manufacturer: Coen
Boiler Rated Horsepower: 725
British Thermal Units (Btus): 17,469 Btus/lb. Method ASTM D240-87

Combustion Analyses	*Run 1*	*Run 2*	*Run 3*
Stack Temperature	558°F	549°F	571°F
Stack Gas Velocity (fl/min.)	1,038	1,043	1,064
Stack Flow Rate (acfm)	7,337	7,371	7,520
Stack Flow Rate (dscfm)	3,439	3,513	3,452
CO Emissions (ppm)	34.7	44.8	27.9
VOC Emissions (ppm)	1.7	1.6	1.7
NO_x Emissions (ppm)	69.0	70.2	69.2
SO_2 Emissions (ppm)	1.4	1.3	1.4
*TSP Emissions Rate (gr/dscf)	0.0330	0.0309	0.0374
Opacity (%):	0.0		

(*Total Suspected Particulate)
Firing Rate: (range during three tests): 133 gal./hr. x 139,700 Btus/gal. = 18.6 million Btus/hr.
171 gal./hr. x 139,700 Btus/gal. = 23.9 million Btus/hr.
Fat preheated 188 degrees F to 208 degrees F for burning stack tests.

A further analysis of comparing the use of yellow grease on the basis of converted factors of pounds per million (MM) Btus of emissions compared to the respective fuels is shown in Table 5, indicating quite satisfactory results.

Table 3. Fuel Analysis

	Semi-Finished Lard	Finished Lard	Choice White Grease	No. 6 Fuel Oil
Ultimate Analysis (%, as fired)[a]				
Carbon	77.7	77.4	77.9	85.8
Hydrogen	12.0	11.5	13.6	12.1
Nitrogen	0.4	0.6	0.2	0.6
Sulfur	0.0	0.1	0.2	1.5
Oxygen (by difference)	9.9	10.4	8.1	-
Heating Value (Btu/lb. as fired)	16,941	16,990	16,977	18,454
Viscosity (cSt)[b]				
100°F	70	97	91	1,357[c]
120°F	23	25	26	520
140°F	17	17	17	232
160°F	-	-	13	128
Boiling Points (°C) [d]				
<260	0.7	0.8	0.5	8.9
280 to 450	5.1	1.9	20.9	29.3
450 to 540	1.8	1.1	11.6	12.5
540 to 700	91.6	95.3	65.6	38.3
> 700	0.3	0.3	0.9	9.8

[a] Fuel oil analysis normalized to zero percent oxygen because oxygen, by difference, as – 0.6 percent.
[b] Measured using a Brookfield DVIII viscometer, a #21 spindle, and a spindle speed of 75 rpm.
[c] Measured using a Brookfield DVIII viscometer, a #21 spindle, and a spindle speed of 15 rpm.
[d] Measured using a Hewlett Packard 5890 plus high temperature gas chromatograph fitted with a Restek MXT-500 silicosteel column and connected to a FID.

Price Comparison

The cost benefits for utilizing fats as burner fuels are of course directly related to the cost comparison of the respective fuels. Geographic pricing relationships as well as the variances between the energy efficiency of individual burners and burner fuel influences the comparative analyses. The following only serves as a model for comparing the respective fats to those of natural gas, No. 2 fuel oil, and No. 6 fuel oil at given prices and the assumption of Btu efficiency and densities of the respective products. The costs per million Btu values were compared to a base of 100 assigned to natural gas. Thus as an illustration, yellow grease is projected to be 70.78 percent the costs per million Btu as compared to natural gas when using the assumptions set forth.

From this basic point in time comparison, the illustration that inedible tallow, choice white grease, and yellow grease are current cost effective burner fuel alternatives is very evident in Table 6.

Resource Supply of Product

Total animal fats/oils, including those derived from used cooking oils/restaurant grease, in the United States is estimated at 11.25 billion pounds. The total is derived from the estimated billion pounds 1.5 edible tallow, 3.2 inedible tallow, 1.8 rendered grease, 2.0 poultry fat, and 2.75 yellow grease. The 2.75 billion pounds of yellow grease recycled annually in the United States primarily by the rendering industry is based on approximately nine pounds generated per population and approximately 6,300 pounds available from each food service unit. The total animal fats/recycled oils and greases represent about one-third the total of the largest oil generating industry in the United States, that of soybean production.

Table 4. Combustion and Emissions

	No. 6 Fuel Oil	Finished Lard (Overall)	Semi-Finished Lard (Overall)
Length of Test (hr.)	0.65	5.90	2.53
Fuel Injection Temperature (°F)	140	130	130
Fuel Firing Rate (million Btu/hr.)	1.74	1.74	1.72
% O_2	2.2	2.0	2.2
% CO_2	14.4	14.7	14.6
ppm CO @ 3% O_2	111	145	147
ppm NO_x @ 3% O_2	395	137	135
ppm SO_2 @ 3% O_2	784	0	0
Zone 1 Air Temperature (°F)	353	350	366
Zone 2 Air Temperature (°F)	752	780	735
Quarl Temperature-Bottom (°F)	1,041	847	887
Quarl Temperature-Top (°F)	1,042	855	897
Economizer Inlet Temperature (°F)	519	556	518
Steam Temperature (°F)	364	379	364
Steam Generation Rate (lb/hr.)	1,266	1,286	1,277
Total Air (lb/hr.)	1,459	1,429	1,412
Zone 1 Air (% of total)	58%	58%	58%
Zone 2 Air (% of total)	33%	34%	34%
Atomizing Air (% of total)	7%	6%	6%
Cooling Air (% of total)	2%	2%	2%

Summary

Animal fats and the resources of recycled cooking oils and restaurant greases have long been recognized for their valuable energy contributions to livestock, poultry, domestic animal, and a variety of other animal diets. Research supported by FPRF has historically, since 1962, provided scientific data to support these uses. Further, FPRF has been involved in both research and initiatives for the utilization of these resources as alternative fuel sources. FPRF has been a charter member of the National Soy Diesel Development Board (National Biodiesel Board) since 1992. It remains an associative directorship and cooperates in the research efforts to commercialize biodiesel. These initiatives have certainly brought biodiesel into prominence as a very viable alternative fuel and its gallonage sales increases annually.

Most recently FPRF has been extremely active in conveying the importance of rendered animal products as resources for biofuel/bioenergy production. As has been pointed out on numerous occasions, research efforts, incentives, and subsidies have favored sources derived from plant origins. These activities have often been at the exclusion of animal origin products.

This current summary for the use of animal fats/greases as burner fuel usage offers an opportunity as effective environment and economic alternatives to meet the burner fuel crisis that is upon us now. Numerous facilities are in the process of acquiring air quality permits and active in interacting with local and state environmental regulators. There have been numerous air quality permits issued for using animal rendered fats in a variety of facilities. Reports for utilizing from 15 percent to exceeding 30 percent of products processed in given plants as the internal energy

Continued on page 51

Table 5. Converted Factors lb./MM Btu

Natural Gas Fired	Source	Units	PM-10	PM	VOC	NO_x	SO_x	CO
Small Boilers								
<100 MM Btu/hr.	AP-42 7/98	lb./MM cf	7.6	7.6	5.5	100	0.6	84
Converted Factors*		lb./MM Btu	0.0072	0.0072	0.0052	0.0952	0.0006	0.0800
No. 2 Distillate Oil								
<100 MM Btu/hr.	AP-42 9/98	lb./M gal.	2	2	0.252	20	71[a]	5
Converted Factors**		lb./MM Btu	0.0143	0.0143	0.0018	0.1429	0.5071	0.0357
No. 6 Residual Oil								
<100 MM Btu/hr.	AP-42 9/98	lb./M gal.	10	10	1.28	55	78.5[b]	5
Converted Factors***		lb./MM Btu	0.0667	0.0667	0.0085	0.3667	0.5233	0.0333
Yellow Grease								
<100 MM Btu/hr. – fat	Stack Test Results	lb./hr.	1.0033	1.0033	0.0367	1.7267	0.0500	0.5
Converted Factors		lb./MM Btu	0.0414	0.0414	0.0015	0.0712	0.0021	0.0224

onversion used 1,050 Btu/ft^3
conversion used 140,000 Btu/gal.
** version used 150,000 Btu/gal.
[a] e. ion factor is 142 x %sulfur, 142 x 0.5 = 71
[b] emission factor is 157 x % sulfur, 157 x 0.5 = 78.5

TABLE 2-2. EMISSION DATA SUMMARY -- BOILER 3, DIESEL*

Client: HC & S
Source: Boiler 3 Diesel

O_2 Corr. Factor (%) 3
Standard Temp. (°F) 68

Run #	2	3	4	Average
Date	16-Oct-02	16-Oct-02	16-Oct-02	
Test Condition	346.2 MMBtu/hr	340.0 MMBtu/hr	340.6 MMBtu/hr	342.3 MMBtu/hr
Barometric Pressure ("Hg)	29.55	29.55	29.55	29.55
Stack Pressure ("Hg)	29.54	29.54	29.54	29.54
Stack Area (ft^2)	78.54	78.54	78.54	78.54
Sampling Time (min.)	60.0	60.0	60.0	60.00
Volume Gas Sampled (scf)	47.432	46.016	41.212	44.887
F-Factor	8970.46	8968.22	8958.96	8959.21
Fuel Flow (lb/hr)	17594	17324	17314	17411
Gas Data				
Average Gas velocity (fps)	23.79	23.31	22.07	23.06
Average Gas Temperature (°F)	107.92	117.08	117.29	114.10
Gas Flowrate (dscfm)*	94412	88582	83769	88921
Gas Analysis (Volume %)				
Carbon Dioxide	7.71	8.45	7.67	7.94
Oxygen	10.55	9.46	10.45	10.08
Water	8.27	13.74	10.80	9.94
Emission Concentration				
Filterable Particulate (gr/dscf)	0.0216	0.0182	0.0195	0.0198
CO (ppm)	15.44	10.63	8.73	11.60
SO_2 (ppm)	2.92	3.01	2.94	2.96
NO_x (ppm as NO_2)	56.37	61.21	54.81	57.46
Emission Rate - lb/hr				
Filterable Particulate	17.45	13.83	13.99	15.09
CO	6.38	4.11	3.19	4.55
SO_2	2.75	2.66	2.46	2.63
NOx as NO_2	38.13	38.85	32.90	36.63
Emission Factor - lb/MMBtu				
Filterable Particulate	0.0546	0.0427	0.0498	0.0490
CO	0.0199	0.0127	0.0114	0.0146
SO_2	0.0086	0.0082	0.0088	0.0085
NO_x as NO_2	0.1194	0.1198	0.1171	0.1188
Emission Concentration @ O_2 Correction				
CO (ppm)	16.14	13.07	24.96	19.24
SO2 (ppm)	4.93	4.72	5.04	4.90
NOx (ppm as NO_2)	95.43	95.78	93.92	95.05

* Measured Flowrates

TABLE 2-3. EMISSION DATA SUMMARY — BOILER 3, DIESEL*

Client: HC & S
Source: Boiler 3 Diesel

O_2 Corr. Factor (%) 3
Standard Temp. (°F) 68

Run #	2	3	4	Average
Date:	16-Oct-02	16-Oct-02	16-Oct-02	
Test Condition	346.2 MMBtu/hr	340.0 MMBtu/hr	340.6 MMBtu/hr	342.3 MMBtu/hr
Barometric Pressure ("Hg)	29.55	29.55	29.55	29.55
Stack Pressure ("Hg)	29.54	29.54	29.54	29.54
Stack Area (ft^2)	78.54	78.54	78.54	78.54
Sampling Time (min.)	60.0	60.0	60.0	60.00
Volume Gas Sampled (dscf)	47.432	46.016	41.212	44.887
F-Factor	8970.46	8968.22	8938.96	8959.21
Fuel Flow (lb/hr)	17594	17324	17314	17411
Gas Data				
Average Gas velocity (fps)	25.79	23.31	22.07	23.06
Average Gas Temperature (°F)	107.92	117.08	117.29	114.10
Gas Flowrate (dscfm)*	101934	92558	101126	98539
Gas Analysis (Volume %)				
Carbon Dioxide	7.71	8.45	7.67	7.94
Oxygen	10.33	9.46	10.45	10.08
Water	8.27	10.74	10.80	9.94
Emission Concentration				
Filterable Particulate (gr/dscf)	0.0216	0.0182	0.0195	0.0198
CO (ppm)	15.44	10.63	8.73	11.60
SO_2 (ppm)	2.92	3.01	2.94	2.96
NO_x (ppm as NO_2)	56.37	61.21	54.81	57.46
Emission Rate - lb/hr				
Filterable Particulate	18.84	14.46	16.89	16.73
CO	6.87	4.29	3.85	5.00
SO_2	2.97	2.79	2.97	2.91
NOx as NO_2	41.17	40.69	39.72	40.50
Emission Factor - lb/MMBtu				
Filterable Particulate	0.0546	0.0427	0.0498	0.0490
CO	0.0199	0.0127	0.0114	0.0146
SO_2	0.0086	0.0082	0.0088	0.0085
NO_x as NO_2	0.1194	0.1198	0.1171	0.1188
Emission Concentration @ O_2 Correction				
CO (ppm)	26.14	16.63	14.96	19.24
SO2 (ppm)	4.95	4.72	5.04	4.90
NOx (ppm as NO_2)	95.43	95.78	93.92	95.05

* Calculated Flowrates

TABLE 2-4. EMISSION DATA SUMMARY — BOILER 3, COOKING OIL*

Client: HC & S
Source: Boiler 3 Cooking Oil

O_2 Corr. Factor (%) 3
Standard Temp. (°F) 68

Run #	5	6	7	Average
Date:	18-Oct-02	18-Oct-02	18-Oct-02	
Test Condition	323.1 MMBtu/hr	316.4 MMBtu/hr	293.2 MMBtu/hr	310.9 MMBtu/hr
Barometric Pressure ("Hg)	29.65	29.65	29.65	29.65
Stack Pressure ("Hg)	29.64	29.64	29.64	29.64
Stack Area (ft^2)	78.54	78.54	78.54	78.54
Sampling Time (min.)	60.0	60.0	60.0	60.00
Volume Gas Sampled (dscf)	44.446	47.795	45.614	45.952
F-Factor	9000.15	9217.13	9424.67	9213.99
Fuel Flow (lb/hr)	19240	18875	17581	18565
Gas Data				
Average Gas velocity (fps)	22.08	24.15	23.20	23.14
Average Gas Temperature (°F)	114.13	119.54	119.67	117.78
Gas Flowrate (dscfm)*	85453	91381	87288	88040
Gas Analysis (Volume %)				
Carbon Dioxide	8.64	8.53	8.71	8.62
Oxygen	9.92	9.75	9.56	9.74
Water	9.85	11.03	11.51	10.80
Emission Concentration				
Filterable Particulate (gr/dscf)	0.0214	0.0120	0.0105	0.0146
CO (ppm)	87.70	46.11	42.08	58.63
SO_2 (ppm)	0.03	0.03	0.04	0.03
NO_x (ppm as NO_2)	67.06	70.25	75.17	70.83
HC >C_1 (ppm)	5.80	11.08	14.62	10.50
Emission Rate - lb/hr				
Filterable Particulate	15.67	9.41	7.85	10.98
CO	32.69	18.38	16.02	22.36
SO_2	0.03	0.03	0.03	0.03
NOx as NO_2	41.06	46.00	47.02	44.69
HC > C_1	1.24	2.33	3.19	2.32
Emission Factor - lb/MMBtu				
Filterable Particulate	0.0524	0.0297	0.0261	0.0360
CO	0.1093	0.0579	0.0532	0.0735
SO_2	0.0001	0.0001	0.0001	0.0001
NO_x as NO_2	0.1373	0.1450	0.1560	0.1461
HC > C_1	0.0041	0.0080	0.0106	0.0076
Emission Concentration @ O_2 Correction				
CO (ppm)	143.01	74.03	66.42	94.49
SO2 (ppm)	0.05	0.05	0.06	0.05
NOx (ppm as NO_2)	109.35	112.79	113.65	113.60
HC >C1 (ppm)	9.46	17.79	23.08	16.77

* Measured Flowrates

TABLE 2-5. EMISSION DATA SUMMARY — BOILER 3, COOKING OIL*

Client: HC & S
Source: Boiler 3 Cooking Oil

O_2 Corr. Factor (%) 3
Standard Temp. (°F) 68

Run #	5	6	7	Average
Date:	18-Oct-02	18-Oct-02	18-Oct-02	
Test Condition	323.1 MMBtu/hr	316.4 MMBtu/hr	293.2 MMBtu/hr	310.9 MMBtu/hr
Barometric Pressure ("Hg)	29.65	29.65	29.65	29.65
Stack Pressure ("Hg)	29.64	29.64	29.64	29.64
Stack Area (ft^2)	78.54	78.54	78.54	78.54
Sampling Time (min.)	60.0	60.0	60.0	60.00
Volume Gas Sampled (dscf)	44.446	47.795	45.614	45.952
F-Factor	9000.15	9217.13	9424.67	9213.99
Fuel Flow (lb/hr)	19240	18875	17581	18565
Gas Data				
Average Gas velocity (fps)	22.08	24.15	23.20	23.14
Average Gas Temperature (°F)	114.13	119.54	119.67	117.78
Gas Flowrate (dscfm)*	91948	90809	84599	89119
Gas Analysis (Volume %)				
Carbon Dioxide	8.64	8.53	8.71	8.62
Oxygen	9.92	9.75	9.56	9.74
Water	9.85	11.03	11.51	10.80
Emission Concentration				
Filterable Particulate (gr/dscf)	0.0214	0.0120	0.0105	0.0146
CO (ppm)	87.70	46.11	42.08	58.63
SO_2 (ppm)	0.03	0.03	0.04	0.03
NO_x (ppm as NO_2)	67.06	70.25	75.17	70.83
HC >C_1 (ppm)	5.80	11.08	14.62	10.50
Emission Rate - lb/hr				
Filterable Particulate	15.67	9.41	7.85	10.98
CO	35.18	18.27	15.53	22.99
SO_2	0.03	0.03	0.03	0.03
NOx as NO_2	44.18	45.71	45.57	45.15
HC > C_1	1.33	2.51	3.09	2.31
Emission Factor - lb/MMBtu				
Filterable Particulate	0.0524	0.0297	0.0261	0.0360
CO	0.1093	0.0579	0.0532	0.0735
SO_2	0.0001	0.0001	0.0001	0.0001
NO_x as NO_2	0.1373	0.1450	0.1560	0.1461
HC > C_1	0.0041	0.0080	0.0106	0.0076
Emission Concentration @ O_2 Correction				
CO (ppm)	143.01	74.03	66.42	94.49
SO2 (ppm)	0.05	0.05	0.06	0.05
NOx (ppm as NO_2)	109.35	112.79	118.65	113.60
HC >C1 (ppm)	9.46	17.79	23.08	16.77

* Calculated Flowrates

2.5. Ultimate Analysis and Heating Value

PSC Analytical Services, Reading, PA analyzed a total of (33) biofuel, biofuel/fuel oil blends and fuel oil samples to establish their comparative combustion chemistry and heating values. (All biofuel blends consist of 33% biofuel and 67% No. 2 fuel oil.) PSC used standard ASTM test methods for all analyses. PSC is certified/ accredited by the USEPA, NIOSH, the US Corp of Engineers, and (12) states.

***Table 3*, Fuel Energy Content and Ultimate Analysis** [1]

Fuel	Energy Content, Btu/Lb.	Ash	Carbon	Hydrogen	Nitrogen	Oxygen	Sulfur	Moisture
Chicken Fat	16,873	0.14%	75.3%	11.4%	0.04%	13.1%	0.006%	(trace)
Chicken Fat - Fuel Oil Blend	18,223	0.02%	82.7%	12.2%	0.06%	3.83%	0.12%	(trace)
Yellow Grease	16,899	0.02%	76.4%	11.6%	0.03%	12.1%	0.005%	(trace)
Yellow Grease - F.O. Blend	18,543	0.01%	80.2%	11.6%	0.07%	8.01%	0.13%	(trace)
Choice White Grease	16,893	0.08%	76.5%	11.5%	0.05%	11.6%	0.007%	(trace)
Ch. Wht. Grease - F.O. Blend	18,493	0.01%	82.2%	12.1%	0.09%	5.48%	0.13%	(trace)
Tallow	16,920	0.03%	76.6%	11.9%	0.02%	11.4%	0.003%	(trace)
Tallow Fuel - Oil Blend	18,523	0.06%	80.7%	11.9%	0.01%	7.22%	0.13%	(trace)
No. 2 Fuel Oil	19,237	0.02%	84.0%	11.9%	0.01%	3.78%	0.35%	(trace)

1) PSC Analytical Services, Reading, PA

2.6. General Characterization

The Material Safety Data Sheets (MSDS) included in the Appendix indicate that the fats and greases tested are neither hazardous nor explosive. From the test team's experience, these fats and greases have a distinct and unpleasant odor. However, their volatility is low and the odors do not diffuse readily.

Reports from industry indicate that chicken fat is very miscible in fuel oil and does not readily separate in solution. The test team subjectively confirmed miscibility during the demonstration project; however, definitive data was not collected.

2.7. Discussion

Preliminary laboratory analyses indicated that fats and greases could be used with the No. 2 boiler burner nozzle and that the fuel handing system designed for the test program could easily handle these biofuels. Actual combustion testing demonstrated these findings. Later testing confirmed that biofuels, both singly and blended, have high heating value, low ash, and low sulfur content. Heating values for the biofuel blends tested are within 95% of the heating value of No. 2 fuel oil.

AAC used a sampling train consisting of a stainless steel nozzle, stainless steel union, stainless steel lined probe, glass filter holder with Teflon filter support, four glass impingers, umbilical cord, vacuum pump, dry gas meter and orifice. Both the probe and filter compartment were heated to 250 deg. F. The impingers were placed in an ice bath to remove moisture from the sample gas stream. A "S" type pitot tube and an inclined manometer measured the gas velocity pressures. A type K thermocouple and a digital thermometer measured the gas temperature. The Denver Instruments Model A-250 analytical balance in the AAC laboratory weighed the particulate samples.

In accordance with US EPA Method 19 (40CFR60), AAC calculated fuel F-Factors using the fuel analysis data presented in Section 3 of this report. F-Factors are used to calculate emission rates in pounds per million Btu, per US EPA methodology.

The US EPA "F Factor" technique is a more convenient method to determine emissions on a mass per unit heat input basis. This technique allows the calculation of emissions without the need for precise measurement of fuel flow and combustion efficiency.

***Table 4*, F-Factors**

Fuel	F-Factor, Fd
Chicken Fat	8,865
Yellow Grease	9,108
Choice White Grease	9,145
Tallow	9,179
No. 2 Fuel Oil	8,850

Source: Advanced Air Consultants, Inc., Murrayville, GA

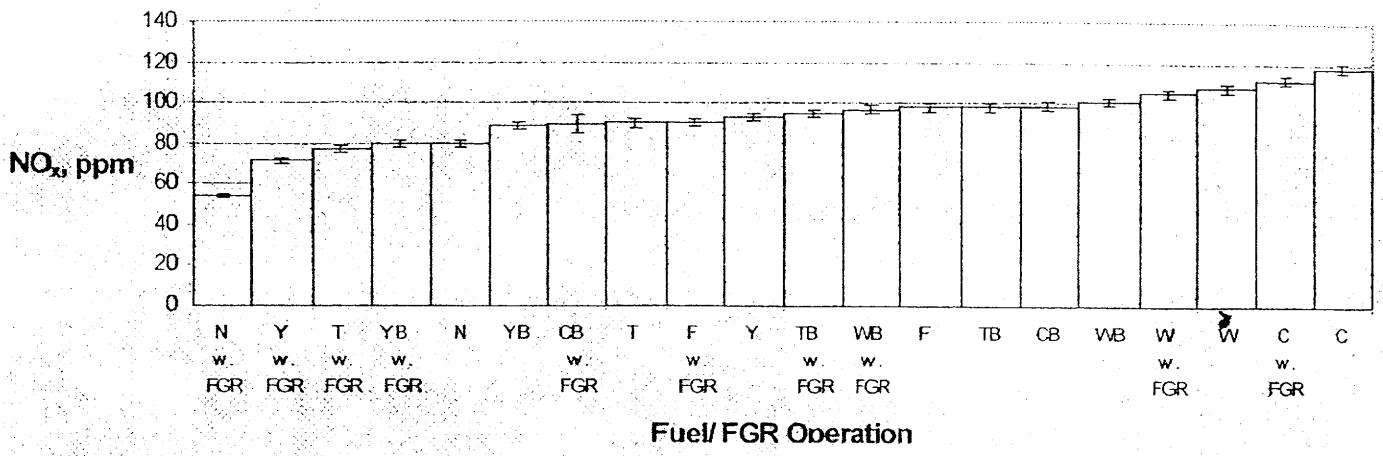
Fd is the ratio of the quantity of dry effluent gas generated by combustion to the gross calorific value of the fuel, $dscf/10^6 Btu$.

Ref.: *Federal Register*, 40:194, Part V, Oct. 6, 1975,

AAC also monitored smokestack opacity. Maximum opacity with chicken fat was 4% and yellow grease was 6%. There was no opacity observed while burning tallow. Opacity was not monitored while burning choice white grease.

Opacity testing was not performed in strict accordance with GA EPD compliance regulations, which require an average value for a series of opacity observations over a one-hour period. Instead, opacity testing during the program consisted of a series of spot observations. However, all opacity readings were taken by GA EPD-certified opacity readers.

Fig. 15, NO_x Emissions

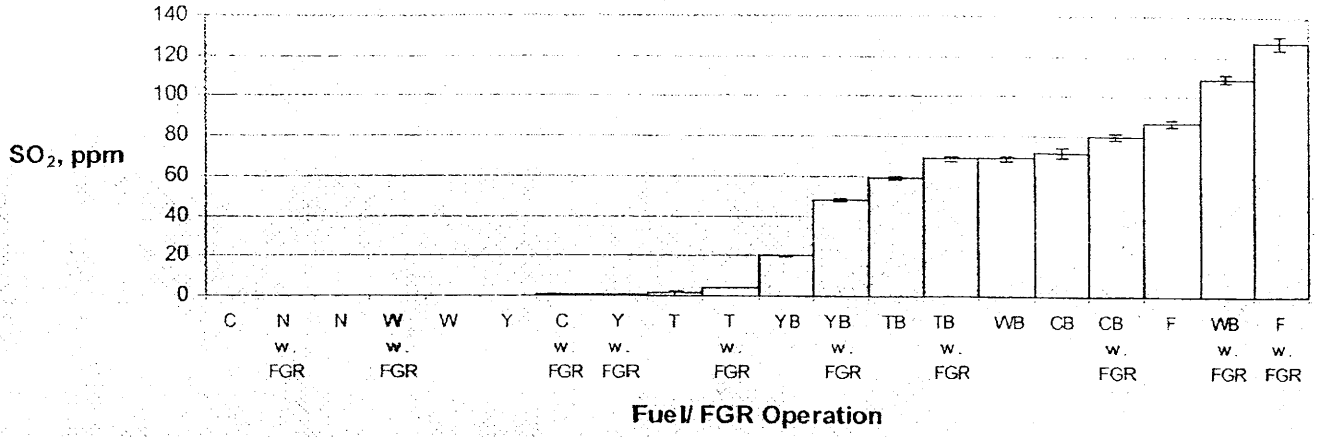


1) All tests were conducted at maximum boiler load.
2) Error bars show std. error calculated for cases: CB with FGR (n=2) and T w/o FGR (n=3). 2% error assumed for all of the other cases.

Fuel	Legend	NOx emissions, ppm			Furnace Temperature, deg. F.		
		w/o FGR	w. FGR	% reduction	w/o FGR	w. FGR	delta
N	NATURAL GAS	80	54	32.5%	1,983	2,010	27
Y	YELLOW GREASE	93	71	23.7%	1,755	1,830	75
T	TALLOW	90	77	14.4%	1,824	1,928	104
YB	YELLOW GREASE - FUEL OIL BLEND	89	80	10.1%	1,773	1,811	38
CB	CHICKEN FAT - FUEL OIL BLEND	99	90	9.1%	1,756	1,843	87
F	No. 2 FUEL OIL	98	91	7.1%	1,836	1,901	65
TB	TALLOW - FUEL OIL BLEND	98	95	3.1%	1,714	1,790	76
WB	CHOICE WHITE GREASE - FUEL OIL BLEND	101	97	4.0%	1,860	1,954	94
W	CHOICE WHITE GREASE	108	105	2.8%	1,855	1,886	31
C	CHICKEN FAT	118	112	5.1%	1,776	n.a.	n.a.

Fig. 15. Legend

Fig. 16, SO_2 Emissions

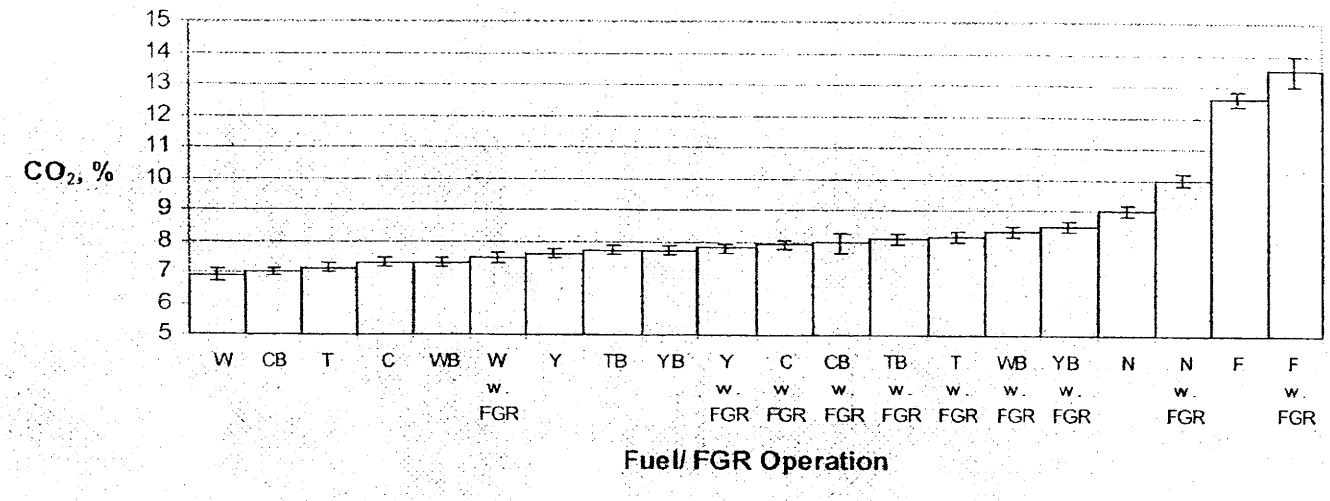


1) All tests were conducted at maximum boiler load.
2) Error bars show std. error (n=2 or greater) calculated for cases: Y, YB, F, W, and C with FGR; and cases T, CB and W w/o FGR. 2% error assumed for all of the other cases.

Fuel	Legend	SO_2 emissions, ppm		
		w/o FGR	w. FGR	delta
N	NATURAL GAS	0	0	0
Y	YELLOW GREASE	0	1	1
W	CHOICE WHITE GREASE	0	0	0
C	CHICKEN FAT	0	0	0
T	TALLOW	1	4	3
YB	YELLOW GREASE - FUEL OIL BLEND	20	48	28
TB	TALLOW - FUEL OIL BLEND	59	69	10
WB	CHOICE WHITE GREASE - FUEL OIL BLEND	69	109	40
CB	CHICKEN FAT - FUEL OIL BLEND	72	80	8
F	No. 2 FUEL OIL	87	127	40

Fig. 16. Legend

Fig. 17, CO_2 Emissions

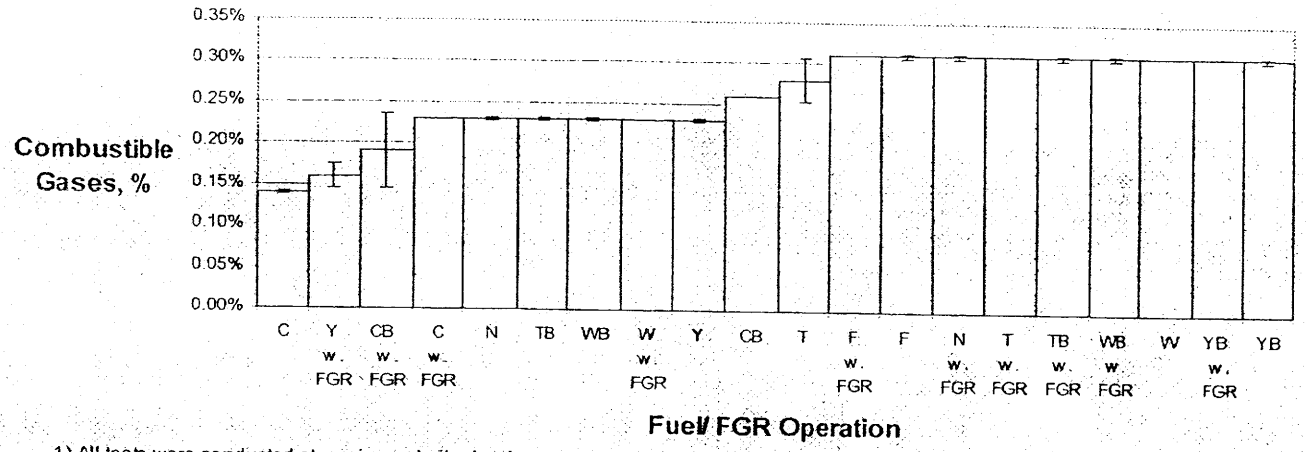


1) All tests were conducted at maximum boiler load.
2) Error bars show std. error (n=2 or greater) calculated for cases: CB, F, and W with FGR, and T and W w/o FGR.
3) 2% error assumed for all of the other cases.

Fuel	Legend	CO_2 emissions, %		
		w/o FGR	w. FGR	delta
W	CHOICE WHITE GREASE	6.9	7.5	0.6
CB	CHICKEN FAT - FUEL OIL BLEND	7.0	8.0	1.0
T	TALLOW	7.1	8.2	1.1
C	CHICKEN FAT	7.3	7.9	0.6
WB	CHOICE WHITE GREASE - FUEL OIL BLEND	7.3	8.3	1.0
Y	YELLOW GREASE	7.6	7.8	0.2
TB	TALLOW - FUEL OIL BLEND	7.7	8.1	0.4
YB	YELLOW GREASE - FUEL OIL BLEND	7.7	8.5	0.8
N	NATURAL GAS	9.0	10.0	1.0
F	No. 2 FUEL OIL	12.6	13.5	0.9

Fig. 17. Legend

Fig. 19, Combustibles in Flue Gas



1) All tests were conducted at maximum boiler load.
2) Error bars show std. error (n=2 or greater) calculated for cases: Y, T, YB, CB, F, W, and C with FGR; and cases T, CB and W w/o FGR.
3) 2% error assumed for all of the other cases.

Legend	Combustibles in Flue Gas, %		
	w/o FGR	w. FGR	delta
CHICKEN FAT	0.14%	0.23%	0.09%
NATURAL GAS	0.23%	0.31%	0.08%
TALLOW - FUEL OIL BLEND	0.23%	0.31%	0.08%
CHOICE WHITE GREASE - FUEL OIL BLEND	0.23%	0.31%	0.08%
YELLOW GREASE	0.23%	0.16%	-0.07%
CHICKEN FAT - FUEL OIL BLEND	0.26%	0.19%	-0.07%
TALLOW	0.28%	0.31%	0.03%
No. 2 FUEL OIL	0.31%	0.31%	0.00%
CHOICE WHITE GREASE	0.31%	0.23%	-0.08%
YELLOW GREASE - FUEL OIL BLEND	0.31%	0.31%	0.00%

Fig. 19. Legend

5.3. Odor Sampling

At no time during the demonstration program did the test team receive any complaints about odor originating from the steam plant. Test team members, BAE faculty and staff associated with the project, and the steam plant personnel (10 individuals, in total) monitored the campus for odor and recorded their findings at least twice for each test series. Odor was monitored (36) times throughout the demonstration program. Each odor test began at the steam plant; and, if the wind speed exceeded 1 to 2 mph, was repeated again 0.5 to 1.0 miles down wind of the steam plant. A check of the UGA campus weather website preceding each test confirmed the wind direction and velocity. All odor testers were asked to verify that they were not suffering from any nasal congestion.

6. CONCLUSIONS

Fats and greases were demonstrated as industrial boiler fuels. These biofuels easily and economically displace No. 2 fuel oil using the same boiler operating procedures as fuel oil without any modifications to internal boiler combustion equipment. The biofuels need to be kept warm during cold weather in order to flow through piping and equipment. When heated to about 160° F. biofuels are easily atomized and ignited. Construction costs for the pump, heat exchanger, instruments, piping, valves, fittings, and electrical system for a system to maintain the 160° F. temperature and to transfer fuel from storage to the boiler was less than $31,000. This total does not include the cost of engineering or the procurement cost for the heat exchanger. Extra costs would be incurred if separate storage tanks were needed for biofuel storage. Research should be accomplished focusing on the issues associated with using existing No. 2 fuel oil storage tanks for the storage of biofuel and biofuel blends.

Air emissions from the combustion of the biofuel oils met or exceeded state and federal air quality permit requirements for The University of Georgia. Nitrogen oxides and particulate emissions were comparable to emissions from the combustion of No. 2 fuel oil, Table 4. Sulfur dioxide emissions and deposits on boiler tubes were similar to those encountered when burning natural gas. Biofuels also have low carbon monoxide emissions. The fuel nozzle used in the UGA boiler was a 1950's design and no special procedures were used to minimize emissions through nozzle placement. Flue gas recirculation (FGR) was tested with 7% to 10% of flue gas being recirculated. FGR did not significantly increase boiler efficiency but did significantly reduce NO_x emissions compared to tests without FGR according to a Students t-test at the $\alpha = 0.05$ significance level. NO_x emissions were not reduced enough to meet regulations for new sources and for non-attainment areas. Additional testing is required using low NO_x nozzle designs and other methods for minimizing emissions. When the boiler was operated at half load, boiler efficiency was significantly greater for a blend of 33% tallow with 77% #2 fuel oil than when using 100% #2 fuel oil ($\alpha = 0.05$).

The biofuel oils have high heating value; low amounts of ash, nitrogen, and moisture; and negligible amounts of sulfur. Heating values of the biofuel oil blends tested are within 95% of the heating value of No. 2 fuel oil. The specific gravity of the biofuels is close to that of No. 2 fuel oil. The biofuels are more viscous than No. 2 fuel oil, but much less viscous than No. 6 fuel oil. However, a blend of 30% biofuel with No. 2 fuel oil has a viscosity that is close to that of No. 2 fuel oil. Boiler efficiency while burning biofuel oil is comparable to that of No. 2 fuel oil.

Table 5, Comparison of UGA Test Emissions to US EPA Criteria Pollutant Emission Factors

Fuel & Firing Condition	NO_x, lb./MMBtu	Filterable PM, lb./MMBtu	CO, lb./MMBtu	SO_2, lb./MMBtu [5]
UGA Boiler No. 2 Emissions, Tested at Max. Steam Load [1]:				
Chicken Fat, controlled with FGR [7]	0.156	0.077	0.008	0.000
Yellow Grease, controlled with FGR [7]	0.097	0.009	0.016	0.001
Choice White Grease, controlled with FGR [7]	0.150	0.038	0.014	0.000
Tallow, controlled with FGR [7]	0.101	0.014	0.018	0.007
No. 2 Fuel Oil, controlled with FGR [7]	0.116	0.010	0.004	0.219
UGA Boiler No. 2 Emissions, Estimated at Max. Steam Load [2]:				
Chicken Fat, uncontrolled (w/o LNB or FGR)	0.164	not available	0.000	0.000
Yellow Grease, uncontrolled (w/o LNB or FGR)	0.127	not available	0.012	0.000
Choice White Grease, uncontrolled (w/o LNB or FGR)	0.154	not available	0.014	0.000
Tallow, uncontrolled (w/o LNB or FGR)	0.118	not available	0.012	0.002
No. 2 Fuel Oil, uncontrolled (w/o LNB or FGR)	0.125	not available	0.003	0.150
Chicken Fat, blended [6], uncontrolled	0.137	not available	0.008	0.124
Yellow Grease, blended [6], uncontrolled	0.122	not available	not available	0.034
Choice White Grease, blended [6], uncontrolled	0.144	not available	0.012	0.119
Tallow, blended [6], uncontrolled	0.129	not available	0.008	0.102
Chicken Fat, blended [6], controlled w. FGR [7]	0.125	not available	0.014	0.138
Yellow Grease, blended [6], controlled w. FGR [7]	0.109	not available	not available	0.083
Choice White Grease, blended [6], controlled w. FGR [7]	0.138	not available	0.033	0.188
Tallow, blended [6], controlled w. FGR [7]	0.125	not available	0.008	0.119
US EPA Emission Factors for Criteria Pollutants (boilers > 100 MMBtu/hr heat input) [3,4]:				
No. 2 Fuel Oil fired, controlled with FGR	0.071	0.014	0.036	0.393
Natural Gas fired, controlled with FGR	0.098	0.002	0.082	0.000
No. 2 Fuel Oil fired, uncontrolled (w/o LNB or FGR)	0.171	0.014	0.036	0.393
Natural Gas fired, uncontrolled (w/o LNB or FGR)	0.186	0.002	0.082	0.000

1) Advanced Air Consultants, Murrayville, GA
2) Emissions data have been estimated using the test results from Advanced Air Consultants and ENERAC 3000E testing.
3) US EPA Fifth Edition 1995, with Supplements: A (1996), B (1996), D (1998), and E (1998)
4) The UGA No. 2 Boiler Operating Permit is based upon a 130 MMBtu/hr heat input.
5) SO2 emissions data have been reviewed in report Section 5.5, *Discussion*.
6) All blended fuels consist of 33% biofuel and 67% No. 2 fuel oil.
7) The FGR system was limited to 7% - 10% flue gas recirculation, see report Section 3.4.

Additional research is needed to understand:

1. What is the effect of biofuel/fuel oil blend proportions on viscosity and miscibility? What blend proportions maintain fluidity (low viscosity) over the range of ambient storage temperatures (say, 32 to 100° F.) typical in industrial applications? What is the minimum amount of agitation required?

2. What are minimum required specifications for fats and greases used as biofuel? What are the requirements for solids removal (screening), MIU (moisture, insolubles, unsaponifiables), Ultimate analysis (C, H, N, S), energy content, specific gravity, viscosity, etc.? How shall biofuels be specified for environmental permitting?

APPENDIX D

Potentially Applicable Regulations

Potentially Applicable Requirements

I. Federal Regulatory Requirements

Emissions Unit	Citation under Federal Regulations	Applicable Requirement	Description of Requirements or Standards
Facility Wide	40 CFR Part 52	No	Approval and Promulgation of Implementation Plans; Rules for Prevention of Significant Deterioration. • The Idaho Falls facility is not a major source with respect to the Prevention of Significant Deterioration program. Facility-wide emissions are less than the applicability threshold.
Affected Facilities: Boiler No. 1 & Boiler No. 2	40 CFR Part 60 Subparts D, Da, Db, Dc	No	Standards of Performance for New Stationary Sources. • Due to the size of the boilers and the dates of construction/modification, the Idaho Falls facility boilers are not subject to NSPS requirements.
Affected Facilities: Storage Tanks	40 CFR Part 60 Subparts K, Ka, Kb	No	Standards of Performance for New Stationary Sources. • The large storage tank is potentially subject to NSPS Subpart K. However, it is exempt from any Subpart K requirements. • Due to the size of the small tank and the date of construction/modification, the small tank is not subject to NSPS requirements.
Facility Wide	40 CFR Part 61, Subpart M	Yes	National Emission Standards for Hazardous Air Pollutants, Asbestos.
Affected Sources	40 CFR Part 63, Subpart A	No	National Emission Standards for Hazardous Air Pollutants for Source Categories. • The Idaho Falls facility is not a major source of HAP and as such the NESHAP program does not apply to this facility.
Affected Sources	40 CFR Part 64	No	Compliance Assurance Monitoring • The Idaho Falls facility is not subject to the requirements of CAM because the facility is not a major source with respect to the Title V operating permit program.
Facility Wide	40 CFR Part 68	No	Chemical Accident Prevention Provisions • The Idaho Falls facility is not currently subject to this regulatory program. Per 68.10(a), the facility must comply with the Provisions' requirements as soon as the quantity of a regulated substance is above its threshold quantity in a process.
Facility Wide	40 CFR Part 70	No	State Operating Permit Program. • The Idaho Falls facility is not a major source with respect to Title V operating permit program thresholds.
Facility Wide	40 CFR Part 82	Yes	Chlorofluorocarbon Regulations.

Potentially Applicable Requirements

II. Idaho Regulatory Requirements

Emission Unit	Citation under IDAPA 58.01.01	Applicable Requirement	Description of Requirements or Standards
Facility Wide	130	Yes	STARTUP, SHUTDOWN, SCHEDULED MAINTENANCE, SAFETY MEASURES, UPSET AND BREAKDOWN
Facility Wide	131	Yes	EXCESS EMISSIONS • Applicability.
Facility Wide	132	Yes	CORRECTION OF CONDITION • Excess emission events must be corrected with all practical speed.
Facility Wide	133	Yes	STARTUP, SHUTDOWN AND SCHEDULED MAINTENANCE REQUIREMENTS • Prescribes procedures for where startup, shutdown, or scheduled maintenance is expected to result in an excess emissions event.
Facility Wide	134	Yes	UPSET, BREAKDOWN AND SAFETY REQUIREMENTS • Prescribes procedures for when upset or breakdown or the initiation of safety measures is expected to result in an excess emissions event.
Facility Wide	135	Yes	EXCESS EMISSIONS REPORTS • Written reports for each excess emissions event must be submitted to the Department within 15 days after the beginning of the event.
Facility Wide	136	Yes	EXCESS EMISSIONS RECORDS • Records of excess emissions must be maintained for 5 years.
Facility Wide	157	Yes	TEST METHODS AND PROCEDURES • Establishes procedures and requirements for test methods and results.
Facility Wide	161	Yes	TOXIC SUBSTANCES • Toxic contaminants shall not be emitted as to injure or unreasonably affect human or animal life or vegetation.
Facility Wide	200	Yes	PROCEDURES AND REQUIREMENTS FOR PERMITS TO CONSTRUCT • Although the Idaho Falls facility is not requesting a PTC with this application, the facility must comply with the PTC rules when adding or modifying an air pollution source.
Facility Wide	201	Yes	PERMIT TO CONSTRUCT REQUIRED
Facility Wide	202	Yes	APPLICATION PROCEDURES
Facility Wide	203	Yes	PERMIT REQUIREMENTS FOR NEW AND MODIFIED STATIONARY SOURCES
Facility Wide	210	Yes	DEMONSTRATION OF PRECONSTRUCTION COMPLIANCE WITH TOXIC STANDARDS
Facility Wide	211	Yes	CONDITIONS FOR PERMITS TO CONSTRUCT
Facility Wide	212	Yes	OBLIGATION TO COMPLY
Facility Wide	213	Yes	PRE-PERMIT CONSTRUCTION
Facility Wide	214	No	DEMONSTRATION OF PRECONSTRUCTION COMPLIANCE FOR NEW AND RECONSTRUCTED MAJOR SOURCES OF HAZARDOUS AIR POLLUTANTS • The facility is not a major source of HAP.

Emission Unit	Citation under IDAPA 58.01.01	Applicable Requirement	Description of Requirements or Standards
Facility Wide	300	No	PROCEDURES AND REQUIREMENTS FOR TIER I OPERATING PERMITS • The Idaho Falls facility is not a major source with respect to the Tier I operating permit program. Table 3-2 presents the facility-wide potential to emit.
Facility Wide	301	No	REQUIREMENT TO OBTAIN TIER I OPERATING PERMIT
Facility Wide	311	No	STANDARD PERMIT APPLICATIONS
Facility Wide	312	No	DUTY TO APPLY
Facility Wide	313	No	TIMELY APPLICATION
Facility Wide	314	No	REQUIRED STANDARD APPLICATION FORM AND REQUIRED INFORMATION
Facility Wide	315	No	DUTY TO SUPPLEMENT OR CORRECT APPLICATION
Facility Wide	317	No	INSIGNIFICANT ACTIVITIES
Facility Wide	368	No	EXPIRATION OF PRECEDING PERMITS
Facility Wide	387	No	REGISTRATION AND REGISTRATION FEES
Facility Wide	388	No	APPLICABILITY
Facility Wide	389	No	REGISTRATION INFORMATION
Facility Wide	390	No	REGISTRATION FEE
Facility Wide	391	No	REQUEST FOR INFORMATION
Facility Wide	392	No	REGISTRATION FEE ASSESSMENT
Facility Wide	393	No	PAYMENT OF TIER I REGISTRATION FEE
Facility Wide	400	Yes	PROCEDURES AND REQUIREMENTS FOR TIER II OPERATING PERMITS
Facility Wide	401	Yes	TIER II OPERATING PERMIT • In accordance with the Consent Order, the Idaho Falls facility is submitting a Tier II application. As can be seen in Table 3-2, facility emissions are less than 100 tpy; thus, a Tier I permit is not required.
Facility Wide	402	Yes	APPLICATION PROCEDURES
Facility Wide	403	Yes	PERMIT REQUIREMENTS FOR TIER II SOURCES
Facility Wide	404	Yes	PROCEDURE FOR ISSUING PERMITS
Facility Wide	405	Yes	CONDITIONS FOR TIER II OPERATING PERMITS
Facility Wide	406	Yes	OBLIGATION TO COMPLY
Facility Wide	407	Yes	TIER II OPERATING PERMIT PROCESSING FEE
Facility Wide	408	Yes	PAYMENT OF TIER II OPERATING PERMIT PROCESSING FEE
Facility Wide	577	Yes	AMBIENT AIR QUALITY STANDARDS FOR SPECIFIC POLLUTANTS
Boilers, Bin Dryers, and Air Makeup Fan Units	585	Yes	TOXIC AIR POLLUTANTS NON-CARCINOGENIC INCREMENTS • This rule applies during the 'construction' permitting process. The Idaho Falls facility will demonstrate compliance with this rule in any subsequent PTC applications.
Boilers, Bin Dryers, and Air Makeup Fan Units	586	Yes	TOXIC AIR POLLUTANTS CARCINOGENIC INCREMENTS • This rule applies during the 'construction' permitting process. The Idaho Falls facility will demonstrate compliance with this rule in any subsequent PTC applications.
Boiler No. 1 & Boiler No. 2	590	No	NEW SOURCE PERFORMANCE STANDARDS • Due to the size of the boilers and the dates of construction/modification, the Idaho Falls facility boilers are not subject to NSPS requirements.

Emission Unit	Citation under IDAPA 58.01.01	Applicable Requirement	Description of Requirements or Standards
Storage Tanks	590	No	NEW SOURCE PERFORMANCE STANDARDS • The large storage tank is potentially subject to NSPS Subpart K. However, it is exempt from any Subpart K requirements. • Due to the size of the small tank and the date of construction/modification, the small tank is not subject to NSPS requirements.
Facility Wide	591	No	NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS • The Idaho Falls facility is not a major source of HAP and as such the NESHAP program does not apply to this facility.
Facility Wide	600	Yes	RULES FOR CONTROL OF OPEN BURNING
Facility Wide *except for the Air Makeup Fan Units and Bin Dryers because they do not vent directly to atmosphere.*	625	Yes	VISIBLE EMISSIONS • A person shall not emit an air pollutant from any point of emission for a period or periods aggregating more that 3 minutes in any 60-minute period that is greater than 20% opacity. • Prescribes test methods and procedures for performance testing.
Facility Wide	650	Yes	RULES FOR CONTROL OF FUGITIVE DUST
Facility Wide	651	Yes	GENERAL RULES • Reasonable precautions shall be taken to prevent particulate matter from becoming airborne.
Boilers, Bin Dryers, and Air Makeup Fan Units	676 & 677	Yes	FUEL BURNING EQUIPMENT – PARTICULATE MATTER. STANDARDS FOR NEW SOURCES & STANDARDS FOR MINOR AND EXISTING SOURCES • When firing gaseous fuel, combustion equipment is limited to 0.15 gr/dscf particulate matter emissions corrected to 3% oxygen. • When firing liquid fuel, combustion equipment is limited to 0.5 gr/dscf particulate matter emissions corrected to 3% oxygen.
Vaculifts, Flaker Drum Dryer 3	701	Yes	PARTICULATE MATTER – NEW EQUIPMENT PROCESS WEIGHT LIMITATIONS • These sources were all installed at the Idaho Falls facility after October 1, 1979, the applicability date for this section. As such, the PM limits established in this section apply to these sources.
Proctors, Flaker Drum Dryers 1 & 2	702	Yes	PARTICULATE MATTER – EXISTING EQUIPMENT PROCESS WEIGHT LIMITATIONS • These sources were all installed at the Idaho Falls facility before October 1, 1979, the applicability date for this section. As such, the PM limits established in this section apply to these sources.
Boiler No. 1	728	Yes	RULES FOR SULFUR CONTENT OF FUELS: DISTILLATE FUEL OIL
Facility Wide	776	Yes	GENERAL RULES • Odorous gases, liquids or solids shall not be emitted as to cause air pollution.

APPENDIX E

Dispersion Modeling Protocol

Idaho Fresh-Pak, Inc.
Tier II Operating Permit Application

Modeling Protocol
Idaho Falls, Idaho

Prepared for:

Idaho Fresh-Pak, Inc.
2177 W 49th S
Idaho Falls, ID 83402

June 2007

Project No. 011010.000.0

Idaho Fresh-Pak, Inc.
Tier II Operating Permit Application

Modeling Protocol
Idaho Falls, Idaho

Prepared for:

Idaho Fresh-Pak, Inc.
2177 W 49th S
Idaho Falls, ID 83402

Prepared by:

Geomatrix Consultants, Inc.
3500 188th Street SW, Suite 600
Lynnwood, WA 98037

June 2007

Project No. 011010.000.0

TABLE OF CONTENTS

TABLE OF TABLES

TABLE OF FIGURES

MODELING PROTOCOL

Idaho Fresh-Pak Tier II Operating Permit Application
Idaho Falls, Idaho

1.0 PROJECT DESCRIPTION AND PURPOSE OF MODELING

Idaho Fresh-Pak, Inc. (Fresh-Pak) owns and operates a dehydrated potato production facility in Bonneville County, approximately four kilometers north of Idaho Falls, Idaho (Idaho Falls facility). A site location map can be found in Figure 1. The facility currently operates several potato processing lines, including Flaker lines and Slice and Dice lines. Two boilers provide process steam for the Idaho Falls facility. Fresh-Pak intends to submit a Tier II Operating Permit application for approval to Idaho Department of Environmental Quality (DEQ).

Fresh-Pak has retained Geomatrix Consultants (Geomatrix) to complete an air quality dispersion modeling analysis as part of the permit application. As recommended in DEQ guidance, this modeling protocol is being submitted to present an overview of a proposed modeling methodology that would be used to generate air quality impact predictions for the permit application.

2.0 DESCRIPTION OF EMISSION QUANTITIES

The Idaho Falls facility has a total of 17 emission sources, including: two boilers, three flaker drum dryers, three Proctor belt dryers, two bin dryers, three Air Make-up Units (AMUs), and four Vacu-lifts (a brand name of cyclone). A Preliminary Facility Site Plan is included in Figure 4. The bin dryers and AMUs all vent inside building #3 then the exhausts exit building #3 via doors, windows, and vents. To accurately represent the emissions in the dispersion model, Geomatrix combined their emissions into a single volume source the size of the building #3.

The main boiler (rated at 61.6 million British thermal units per hour [MMBtu/hr]) at the Idaho Falls facility will fire natural gas, diesel fuel, and biofuels. The second boiler (rated at 26.7 MMBtu/hr) will fire natural gas, diesel fuel, and biofuels, as well. Steam from the two boilers

is used by various facility process units, including heating the three flaker drum dryers and for the three Proctor belt dryers. The two bin dryers and the three AMUs fire natural gas.

Geomatrix will calculate potential emission rates using available source test data, the Environmental Protection Agency's (EPA) AP-42 reference document, and other related production rates and maximum operating schedules (8,760 hours/year).

3.0 MODELING APPLICABILITY ASSESSMENT

For the purposes of this modeling analysis, Geomatrix will model the potential criteria pollutant emissions from the 17 emission sources at the Idaho Falls facility. Bonneville County is currently in attainment for all criteria pollutants.

4.0 MODELING ANALYSES METHODOLOGY

4.1 MODEL USED

Geomatrix reviewed regulatory modeling techniques to select the most appropriate air quality dispersion model to simulate dispersion of air pollutants emitted by the Idaho Falls facility. Building downwash and exhaust plumes that impact complex terrain are issues that influence the selection of regulatory modeling tools. At the Idaho Falls facility, facility buildings will potentially create building downwash from facility sources. Local terrain is presented in Figure 1.

As of December 9, 2005, AERMOD replaced ISCST3 as the model recommended by the EPA *Guideline on Air Quality Models* (codified as Appendix W to 40 CFR Part 51, referred to hereafter as the Guideline) as the preferred dispersion model for areas containing both simple and complex terrain. AERMOD also includes the PRIME downwash algorithms to estimate effects of surrounding buildings on the dispersion of plumes. Therefore, this analysis will be conducted using the current AERMOD dispersion model (version 07026).

4.2 CRITERIA POLLUTANT MODELING METHODOLOGY

Potential facility emissions will be modeled using AERMOD, and model-predicted concentrations will then be added to appropriate background pollutant concentrations to account for other sources contributing to existing pollutant concentrations. The criteria pollutant concentrations (background plus modeled) will be compared against the National

Ambient Air Quality Standards (NAAQS). Geomatrix will use background concentrations from the *IDEQ Background Concentrations for Use in New Source Review Dispersion Modeling* memo (March 14, 2003), for Rural Agricultural Regional Category.

5.0 MODEL INPUT DATA

AERMOD will be applied to potential criteria pollutant emission rates using the regulatory defaults in addition to the options and data discussed in this section.

5.1 METEOROLOGICAL DATA

Geomatrix has conducted a survey of available meteorological data for use in the simulations. A representative five-year meteorological data set will be prepared using available surface and upper air meteorological data. Surface meteorology from the Idaho National Laboratory (INEEL) station in Idaho Falls, Idaho (approximately 5 kilometers south of the facility) with missing data supplemented by surface observations from the INEEL station in Roberts, Idaho (approximately 20 kilometers northwest of the facility) and National Weather Service (NWS) surface observations from Idaho Falls Fanning Field (approximately 4 kilometers southwest of the facility). NWS upper air data from the Boise Airport (approximately 330 kilometers west of the facility) are also included for the five-year meteorological data set. According to the Guideline, five years of representative meteorological data are considered adequate for dispersion modeling applications.

The Idaho Falls facility is located in the Snake River Valley. The Snake River Valley directly impacts the surface meteorological data, especially wind speed and direction. Due to the proximity of the Idaho Falls surface station and the location of the station within the Snake River Valley, the surface meteorological data is very representative of the Idaho Falls facility. A wind rose presenting five years of surface wind speed and wind direction from the Idaho Falls station is shown in Figure 2. The wind rose shows predominantly high winds from the southwest and south directions following the Snake River valley and slower winds from the north direction. The average wind speed is 3.24 meters per second (m/s); and calm conditions occur less than 0.07 percent of the time.

The Boise airport was chosen as the regional upper air station because the Boise data were thought to be the most representative of the Idaho Falls facility. The Boise airport is also

located in the Snake River Valley and should consequently represent appropriate upper air conditions for the Idaho Falls facility.

Additional meteorological variables and geophysical parameters are required for use in the AERMOD dispersion modeling analysis to estimate the surface energy fluxes and construct boundary layer profiles. Surface characteristics including the surface roughness length, the albedo, and the Bowen ratio will be assigned on a sector-by-sector basis using land-use data within three kilometers of the Idaho Falls meteorological site. The USGS 1992 National Land Cover land-use data set (NLCD92) to be used in the analysis has a 30-meter mesh size and over 30 land-use categories.[1] The NLCD92 land-use designations were compared to a current aerial photograph of the three kilometer area surrounding the Idaho Falls meteorological site and the NLCD92 data are appropriate for land-use determinations.

The NLCD92 data will be processed using the utilities that accompany the CALPUFF modeling system. Land-use will be characterized using 12 sectors surrounding the facility. Within each sector, a weighted average surface roughness length, albedo, and Bowen ratio will be calculated from the characteristics recommended for each land use by the CALPUFF utility program MAKEGEO. Arithmetic averages will be used for the albedo and Bowen ratio, while a geometric average will be used for surface roughness length. This land-use analysis and corresponding surface roughness lengths, albedo, and Bowen ratios are shown in Figure 3.

The EPA meteorological program AERMET (Version 06341) will be used to combine the hourly surface meteorological observations with twice daily upper air soundings from the Boise airport and derive the necessary meteorological variables for AERMOD. The upper air data will be used to estimate the temperature lapse rate aloft and subsequently be used by AERMET to predict the development of the mixed layer height. The Bulk-Richardson option was used to estimate dispersion variables and surface energy fluxes during nocturnal periods, while solar radiation and wind speed are used by AERMET to estimate these same variables during the day.

5.2 EMISSION RELEASE PARAMETERS

Figure 4 shows the site plan of the Idaho Falls facility with estimated locations of the 12 emission point stacks and one volume source as well as significant structures that could

[1] The USGS NLCD92 data set is described and can be accessed at http://landcover.usgs.gov/natllandcover.php

potentially influence downwash from the stacks. Table 1 summarizes the preliminary release parameters that will be used to represent the facility stacks in the modeling analysis. The final stack parameters will be reported in the final modeling analysis. Horizontal stack releases are given an exit velocity of 0.001 m/s to represent no plume rise due to momentum and an exit diameter of 0.001 m to prevent the effects of stack-tip downwash on a horizontal stack. Volume source release parameters were calculated based on guidance from the AERMOD manual.[2]

The existing building dimensions and facility configuration will be provided to AERMOD to assess potential downwash effects. Wind-direction-specific building profiles will be prepared for the modeling using the EPA's Building Profile Input Program for the PRIME algorithm (BPIP PRIME). The facility layout provided by Fresh-Pak and building elevations will be used to prepare data for BPIP PRIME, which provides the necessary input data for AERMOD.

5.3 ELEVATION DATA

Terrain elevations for receptors and emission sources will be prepared using digital elevation models (DEMs) developed by the United States Geological Survey of nine 7.5-minute quadrangles obtained from the internet (http://www.mapmart.com): Ammon, Idaho Falls North, Idaho Falls South, Lewisville, Rigby, Roberts, Shattuck Butte, Ucon, and Woodville. These data have a horizontal spatial resolution of 10 meters (m). The 10-kilometer (km) square simulation domain that was used to assess the Idaho Fall facility potential emission impacts is shown in Figure 1.

For the dispersion modeling analysis, three nested receptor grids, each centered on the facility, will be developed: an outer grid to the maximum extent of the domain with 250-meter spacing, a 5-km by 5-km nested grid with 100-meter spacing, and a 1-km by 1-km receptor grid with 25-m spacing. Receptors were also located at 10-m intervals along the facility fenceline. The base elevation and hill height scale for each receptor were determined using the EPA's terrain processor, AERMAP (Version 06341). AERMAP generates a receptor output file formatted for use by AERMOD. The modeling receptor grids are shown in Figure 5.

[2] Table 3-1. Summary of Suggested Procedures for Estimating Initial Lateral Dimensions and Initial Vertical Dimensions for Volume and Line Sources. User's Guide for the AMS/EPA Regulatory Model – AERMOD. EPA-454/B-03-001 (September 2004).

5.4 MODELING RESULTS

Geomatrix will apply the AERMOD model using the Idaho Falls facility potential criteria pollutant emission rates and compare the sum of modeling results and background concentrations to the NAAQS. The 6th highest 24-hour average PM10 concentration over the five years of modeling will be compared to the applicable NAAQS. For all other criteria pollutants and averaging periods, the highest, 1st high criteria pollutant concentrations will be added to the background and compared to the NAAQS.

TABLES

TABLE 1

POINT SOURCE AND VOLUME SOURCE ESTIMATED RELEASE PARAMETERS

Tier II Operating Permit Application
Idaho Falls, Idaho

Source	Stack Exit Direction	Height (ft)	Actual Inside Diameter[1] (ft)	Model Stack Diameter [2] (m)	Exit Velocity[3] (m/s)	Temperature (°F)
Boiler #1	Vertical	39	3.42	1.04	8.44	390
Boiler #2	Vertical	39	2.58	0.79	5.70	390
Proctor Dryer #1	Horizontal	28	3.0	0.001	0.001	180
Proctor Dryer #2	Horizontal	28	3.0	0.001	0.001	180
Proctor Dryer #3	Horizontal	28	3.0	0.001	0.001	180
Flaker Drum Dryer #1	Vertical	33	3.75	1.14	39.71	110
Flaker Drum Dryer #2	Vertical	34	3.75	1.14	39.71	110
Flaker Drum Dryer #3	Vertical	34	3.75	1.14	35.87	109
Flaker Lines 1 & 2 Vaculift	Horizontal	30	0.8	0.001	0.001	110
Flaker Line 3 Vaculift	Horizontal	30	0.8	0.001	0.001	110
Bagroom Vaculift	Horizontal	30	0.88	0.001	0.001	110
Canline Vaculift	Horizontal	28	0.8	0.001	0.001	Ambient

Volume Source	Height [5] (ft)	Initial Sigma Y [5] (ft)	Initial Sigma Z [5] (ft)
Plant [4]	12	53.31	11.16

1 The Vaculift stacks have rectangular cross-sections; the diameters shown are for a circular cross-section with an equivalent area.

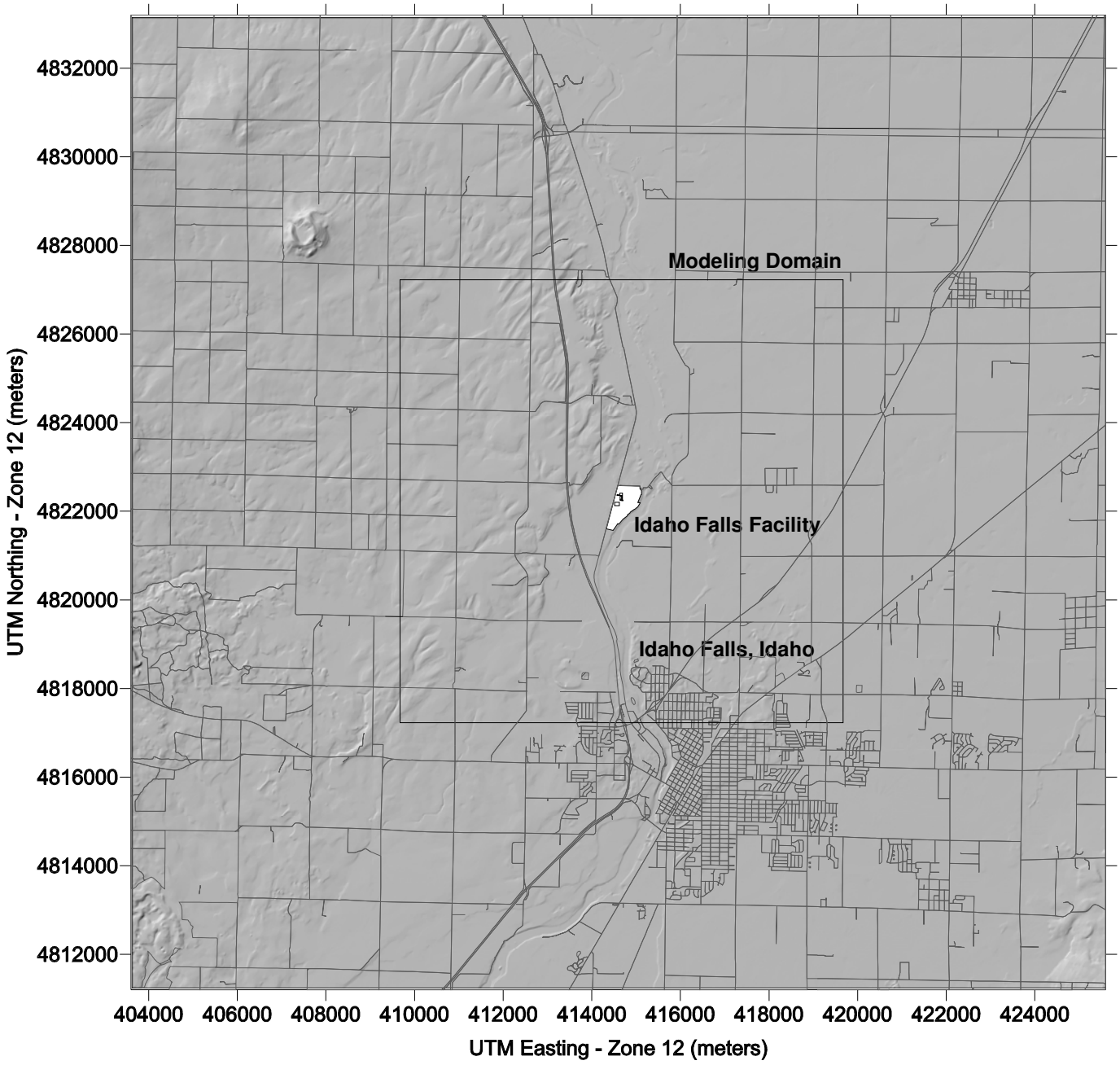
2 For all source release points that are oriented horizontally, the exit diameters are set to 0.001 meters to prevent stack tip downwash effects.

3 For all source release points that are oriented horizontally, the exit velocities are set to 0.001 m/s to eliminate plume rise due to exhaust momentum.

4 The Plant volume source represents the Bin Dryers 1 and 2; the Waste Plant AMU; the Flaker Room AMU; and the Bag Room AMU.

5 The volume source stack height is half of the Main Building height. The initial Sigma Y value is the Building length divided by 4.3, and the initial Sigma Z value is the Building height divided by 2.15.

FIGURES

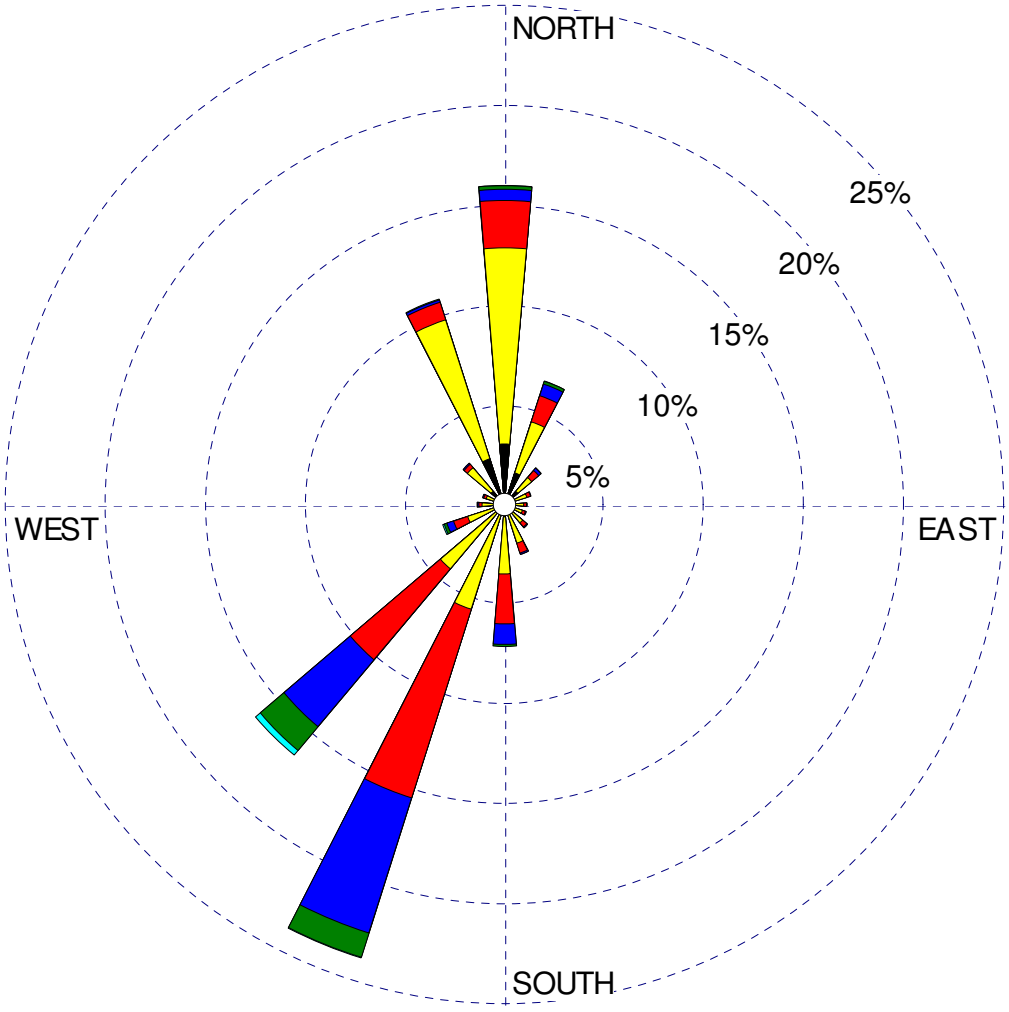


GEOMATRIX

SITE LOCATION MAP & LOCAL TERRAIN
Tier II Operating Permit Application
Idaho Falls, Idaho

Project No.
11010

Figure
1



WIND SPEED
(m/s)

- >= 10.0
- 7.5 - 10.0
- 5.0 - 7.5
- 3.0 - 5.0
- 1.5 - 3.0
- 0.5 - 1.5

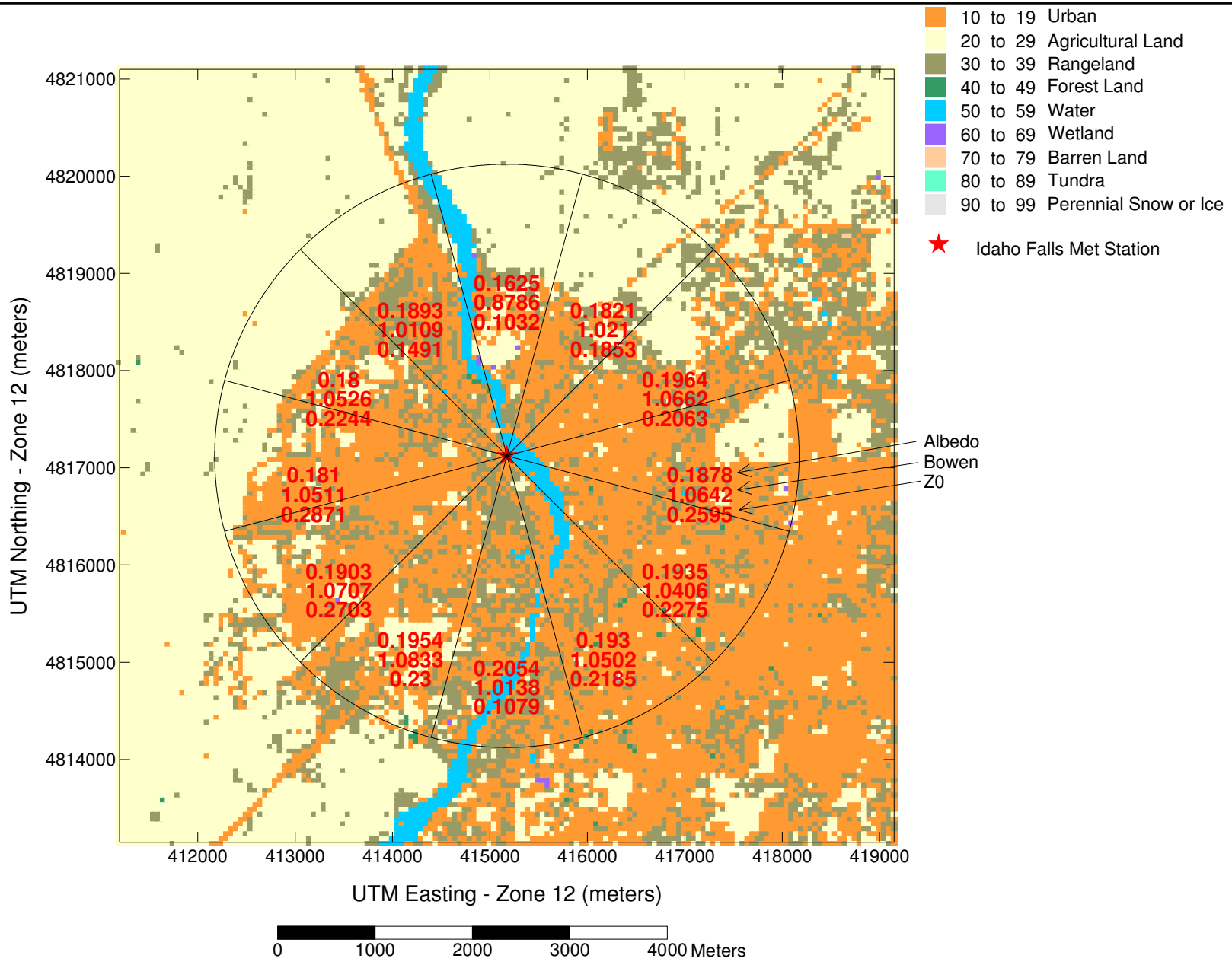
Calms: 0.07%

GEOMATRIX

WINDROSE FOR INEEL IDAHO FALLS SITE, 15M LEVEL, 2000-2004
Tier II Operating Permit Application
Idaho Falls, Idaho

Project No.
11010

Figure
2

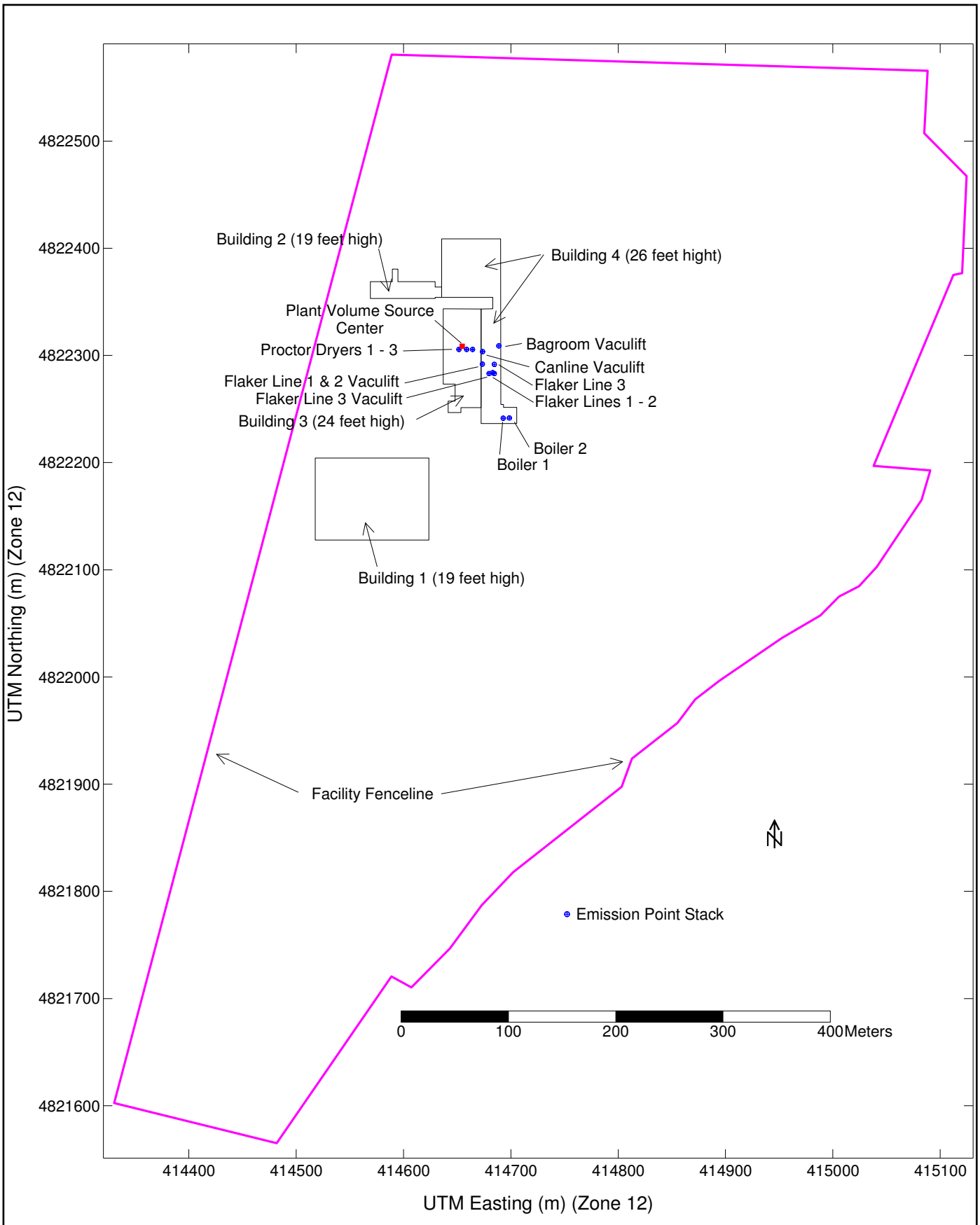


GEOMATRIX

AERMET IDAHO FALLS INEEL SITE LAND-USE ANALYSIS
Tier II Operating Permit Application
Idaho Falls, Idaho

Project No.
11010

Figure
3

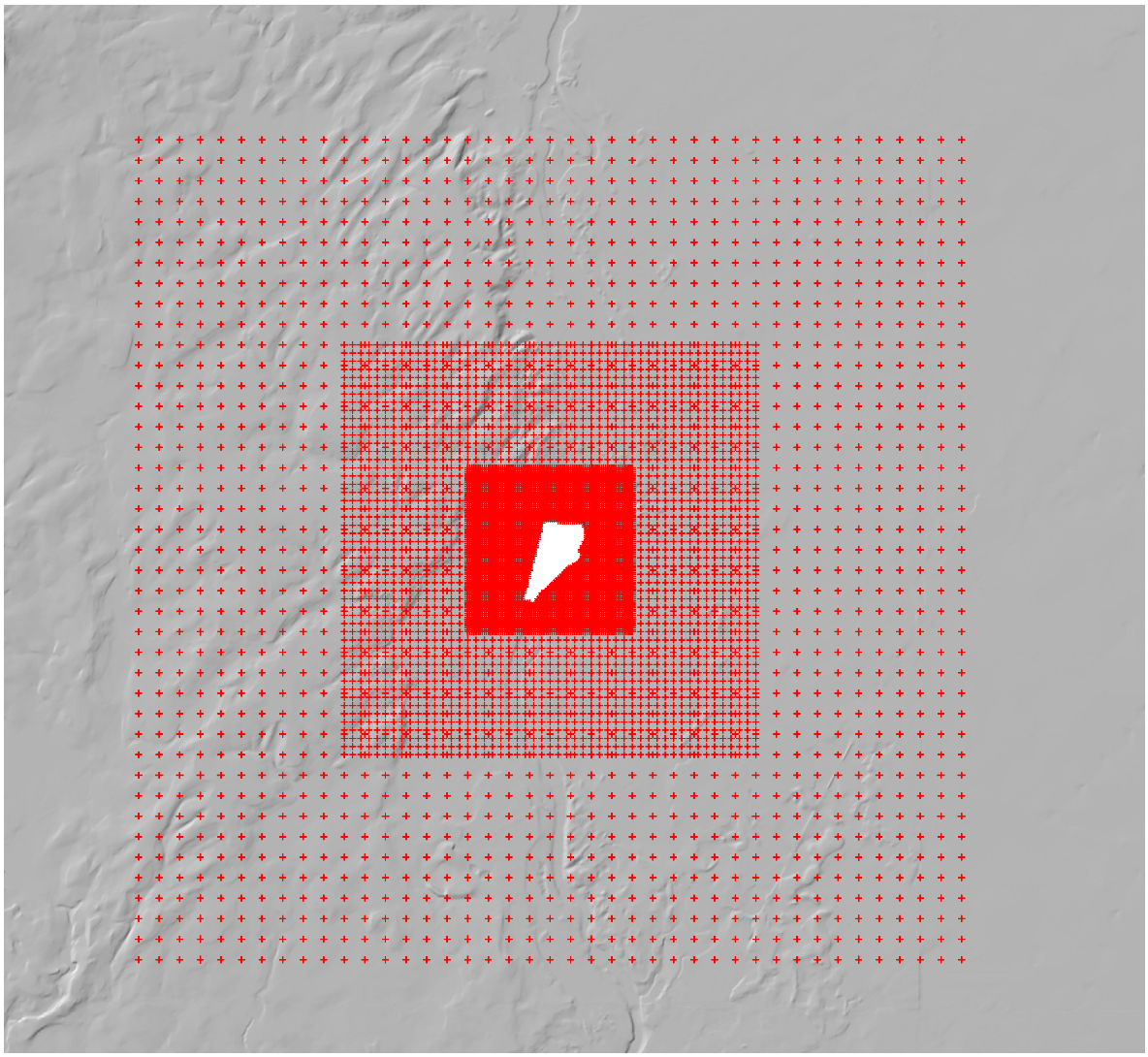


GEOMATRIX

PRELIMINARY FACILITY SITE PLAN
Tier II Operating Permit Application
Idaho Falls, Idaho

Project No.
11010

Figure
4



GEOMATRIX

MODELING RECEPTOR LOCATIONS
Tier II Operating Permit Application
Idaho Falls, Idaho

Project No.
11010

Figure
5

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON, BOISE, ID 83706 · (208) 373-0502

C. L. "BUTCH" OTTER, GOVERNOR
TONI HARDESTY, DIRECTOR

June 28, 2007

Kyle Heitkamp
Geomatrix Consultants
Lynnwood, WA

RE: Modeling Protocol for the Idaho Fresh-Pak Facility Located in Idaho Falls, Idaho

Kyle:

DEQ received your dispersion modeling protocol on June 20, 2007. The modeling protocol was submitted on behalf of Idaho Fresh-Pak. The modeling protocol proposes methods and data for use in the ambient impact analyses of a Tier II Operating Permit application for their facility in Idaho Falls, Idaho.

The modeling protocol has been reviewed and DEQ has the following comments:

- Comment 1: The application should provide documentation and justification for stack parameters used in the modeling analyses, clearly showing how stack gas temperatures and flow rates were estimated. In most instances, applicants should use typical parameters, not maximum temperatures and flow rates.

- Comment 2: The proposed procedures for selecting surface characteristics to use in AERMET indicate a weighted geometric average will be used for surface roughness. Use of the geometric mean is not discussed in the AERMET users' manual. DEQ aggress that the geometric mean is probably more appropriate for evaluating a representative surface roughness because the values within a sector may vary over several orders of magnitude. However, please include more discussion in the submitted final modeling report that explains and justifies use of the geometric mean rather than the arithmetic mean.

- Comment 3: Please provide thorough documentation of the AERMET analyses such that the results can be duplicated. Provide all input and output files for AERMET and any other processor programs used.

DEQ's modeling staff considers the submitted dispersion modeling protocol, with resolution of the additional items noted above, to be approved. It should be noted, however, that the approval of this modeling protocol is not meant to imply approval of a completed dispersion modeling analysis. Please refer to the *State of Idaho Air Quality Modeling Guideline*, which is available on the Internet at http://www.deq.state.id.us/air/permits_forms/permitting/modeling_guideline.pdf, for further guidance.

To ensure a complete and timely review of the final analysis, our modeling staff requests that electronic copies of all modeling input and output files (including BPIP and AERMAP input and output files) are submitted with an analysis report. If DEQ provided model-ready meteorological data files, then these do not need to be resubmitted to DEQ with the application. If you have any further questions or comments, please contact me at (208) 373-0112.

Sincerely,

Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112

APPENDIX F

Modeling Analysis Compact Disk